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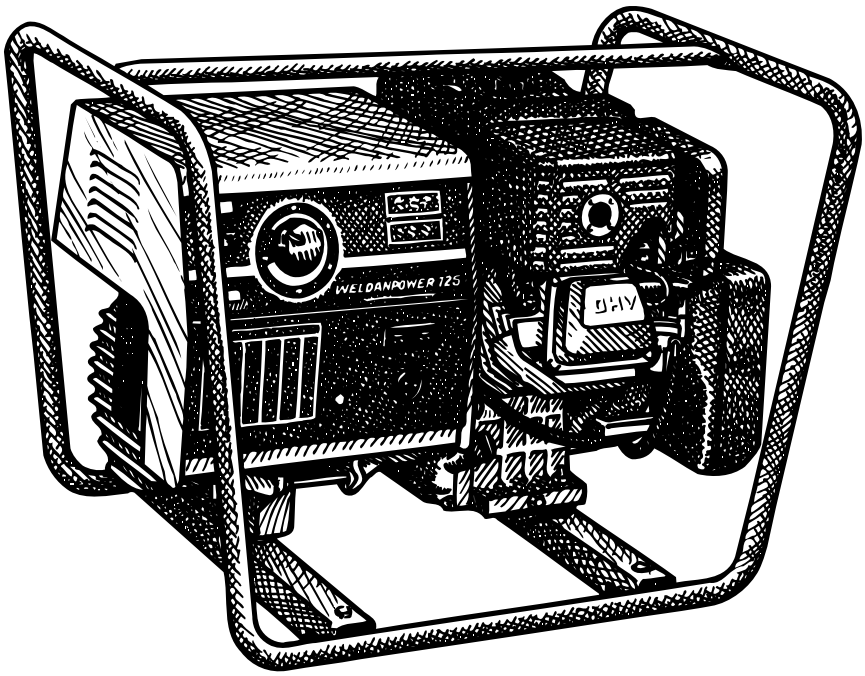
SVM 113-A
January, 1996

WELDANPOWER™ 125

For use with machine code numbers **10158** and **10160**



Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation . . . and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.

SERVICE MANUAL

LINCOLN® ELECTRIC

World's Leader in Welding and Cutting Products

Premier Manufacturer of Industrial Motors

Sales and Service through subsidiaries and Distributors Worldwide
22801 St. Clair Ave. Cleveland, Ohio 44117-1199 U.S.A. Tel. (216) 481-8100

SAFETY

⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE powered equipment.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

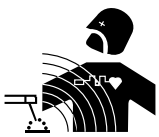
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

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ELECTRIC SHOCK can kill.

3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- **Semiautomatic DC Constant Voltage (Wire) Welder.**
- **DC Manual (Stick) Welder.**
- **AC Welder with Reduced Voltage Control.**

3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.

3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode in water for cooling.

3.h. Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

ARC RAYS can burn.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. I standards.

4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases.When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

5.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

5.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

5.d. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer’s safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

5.e. Also see item 1.b.

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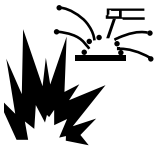


WELDING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to “Safety in Welding and Cutting” (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

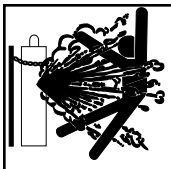
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”, AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.



CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically “hot” parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, “Precautions for Safe Handling of Compressed Gases in Cylinders,” available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer’s recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer’s recommendations.

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PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté specifiques qui parraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état defonctionnement.
   d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.

2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.

3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:

   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.

4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.

7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.

10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.

11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.

2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.

3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur place.

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INSTALLATION

TECHNICAL SPECIFICATIONS - WELDANPOWER 125

INPUT - GASOLINE ENGINE					
Manufacturer	**Description**	**Speed**	**Displacement**	**Ignition**	**Capacities**
Briggs & Stratton Vanguard®	1 cyl., 4 cycle air-cooled gasoline 9 HP @ 3600 RPM	3400 RPM Full Load 3750 RPM High Idle 2400 RPM Low Idle	18.06 cu. in. (296 cc)	Manual, Recoil start; Manual choke	Fuel: 1.6 gal. (6.0 l) Oil: 1.25 qt. (1.2 l)

RATED OUTPUT - WELDER		
Duty Cycle	**Amps**	**Volts at Rated Amperes**
30% Duty Cycle	125 Amps DC	25 VDC
60% Duty Cycle	100 Amps DC	25 VDC

OUTPUT - WELDER AND GENERATOR		
Welding Ranges	**Welder Open Circuit Voltage**	**AC Auxiliary Power**
50 - 125 Amps	80 VDC Max.	4500 Continuous Watts (3500 Watts CSA)

PHYSICAL DIMENSIONS			
Height	**Width**	**Depth**	**Weight**
21.13 in. 530 mm	20 in. 508 mm	30 in. 762 mm	190 lb. 86.4 kg

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INSTALLATION

Read this entire installation section before you start installation.

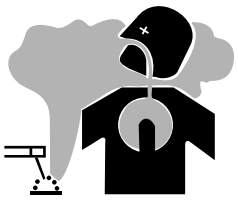
SAFETY PRECAUTIONS

⚠ WARNING

Do not attempt to use this equipment until you have thoroughly read all the operation and maintenance manuals supplied with your machine. They include important safety precautions; detailed engine starting, operating, and maintenance instructions; and parts lists.

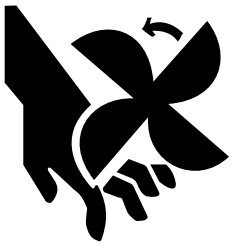
ELECTRIC SHOCK can kill.

- Do not touch electrically live parts or electrodes with your skin or wet clothing.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.



ENGINE EXHAUST can kill.

- Use in open, well ventilated areas or vent exhaust to the outside.
- Do not stack anything on or near the engine.



MOVING PARTS can injure.

- Do not operate this equipment with any of its doors open or guards off.
- Stop the engine before servicing it.
- Keep away from moving parts.

Only qualified personnel should install, use, or service this equipment.

LOCATION AND VENTILATION

Whenever you use the WELDANPOWER 125, be sure that clean cooling air can flow through the machine's gasoline engine and the generator. Avoid dusty, dirty areas. Also, keep the machine away from heat sources. Do not place the back end of the generator anywhere near hot engine exhaust from another machine. And of course, make sure that engine exhaust is ventilated to an open, outside area.

The WELDANPOWER 125 may be used outdoors. Do not set the machine in puddles or otherwise submerge it in water. Such practices pose safety hazards and cause improper operation and corrosion of parts.

Always operate the WELDANPOWER 125 with the case roof on and all machine components completely assembled. This will protect you from the dangers of moving parts, hot metal surfaces, and live electrical devices.

STORING

1. Store the machine in a cool, dry place when it's not in use. Protect it from dust and dirt. Keep it where it can't be accidentally damaged from construction activities, moving vehicles, and other hazards.
2. If you will be storing the machine for over 30 days, you should drain the fuel to protect fuel system and carburetor parts from gum deposits. Empty all fuel from the tank and run the engine until it stops from lack of fuel.
3. You can store the machine for up to 24 months if you use Briggs & Stratton Gasoline Additive, Part No. 5041 (available from any Authorized Briggs & Stratton Service Center), in the fuel system. Mix the additive with the fuel in the tank and run the engine for a short time to circulate the additive through the carburetor.
4. While the engine is still warm, drain the oil and refill with fresh 10W30 oil.
5. Remove the spark plug and pour approximately 1/2 ounce (15 ml) of engine oil into the cylinder. Replace the spark plug and crank the engine slowly to distribute the oil.
6. Clean any dirt and debris from the cylinder and cylinder head fins and housing, rotating screen, and muffler areas.
7. Store in a clean, dry area.

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STACKING

WELDANPOWER 125 machines CANNOT be stacked.

TILTING

Place the machine on a secure, level surface whenever you use it or store it. Any surfaces you place it on other than the ground must be firm, non-skid, and structurally sound.

The gasoline engine is designed to run in a level position for best performance. It can operate at an angle, but this should never be more than 15 degrees in any direction. If you do operate it at a slight angle, be sure to check the oil regularly and keep the oil level full. Also, fuel capacity will be a little less at an angle.

LIFTING

The WELDANPOWER 125 should be lifted by two people. (It weighs 190 lbs/86.4 kg.) Its welded tube roll cage is designed to make lifting easy.

PRE-OPERATION ENGINE SERVICE

Read and understand the information about the gasoline engine in the ***Operation*** and ***Maintenance*** sections of this manual before you operate the WELDANPOWER 125.

⚠ WARNING

- Keep hands away from the engine muffler or HOT engine parts.
- Stop the engine when fueling.
- Do not smoke when fueling.
- Remove the fuel cap slowly to release pressure.
- Do not overfill the fuel tank.
- Wipe up spilled fuel and allow the fumes to clear before starting the engine.
- Keep sparks and flame away from the fuel tank.

OIL

The WELDANPOWER 125 is shipped with the engine filled with SAE 10W-30 oil. **CHECK THE OIL LEVEL BEFORE YOU START THE ENGINE**. This is an added precaution. Do not screw in the dipstick when checking the oil. If it is not full, add enough oil to fill it. DO NOT OVERFILL. Be sure the fill plug is tight.

For more oil fill and service information, see the ***Maintenance*** section of this manual.

FUEL

Fill the fuel tank with clean, fresh, regular grade lead-free gasoline. **DO NOT MIX OIL WITH THE GASOLINE.**

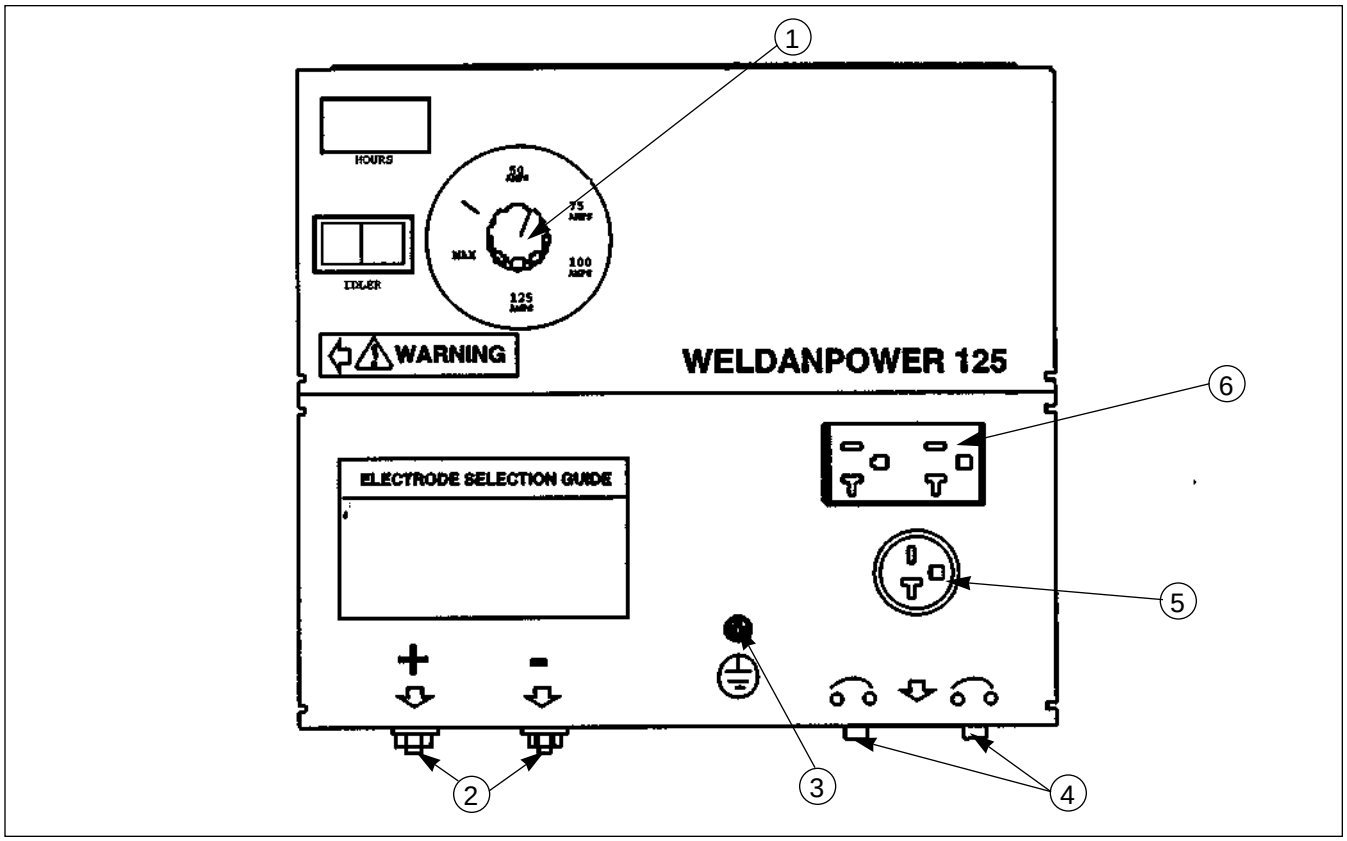
The WELDANPOWER 125 has a plastic, 1.6 gallon (6.0 liter) fuel tank mounted on the engine. See the ***Operation*** and ***Maintenance*** sections of this manual for more details about fuel.

SPARK ARRESTER

Gasoline engine mufflers may emit sparks when the engine is running. Some federal, state, or local laws require spark arresters in locations where unarrested sparks could present a fire hazard.

Standard mufflers and deflectors (like the ones included with the WELDANPOWER 125) do not act as spark arresters. When local laws require it, a spark arrester must be installed on the machine and properly maintained. Consult Briggs & Stratton for proper engine spark arrester.

FIGURE A.1 - WELDANPOWER 125 OUTPUT CONNECTIONS



1. CURRENT CONTROL DIAL
2. WELD OUTPUT TERMINALS (2)
3. GROUND STUD
4. CIRCUIT BREAKERS (2) - 20 AMP (15 AMP CSA)
5. RECEPTACLE - 230 VOLT, 20 AMP (15 AMP CSA)
6. DUPLEX RECEPTACLE - 115 VOLT, 20 AMP (15 AMP CSA)

ELECTRICAL OUTPUT CONNECTIONS

See Figure A.1 for the location of the current control dial, weld output terminals, ground stud, circuit breakers, 230 and 115 volt receptacles.

WELDING CABLE CONNECTIONS

Cable Size and Length

Be sure to use welding cables that are large enough. The correct size and length becomes especially important when you are welding at a distance from the welder.

Table A.1 lists recommended cable sizes and lengths for rated current and duty cycle. Length refers to the distance from the welder to the work and back to the welder. Cable diameters are increased for long cable lengths to reduce voltage drops.

TABLE A.1
RECOMMENDED WELDING CABLE SIZE AND LENGTH

TOTAL COMBINED LENGTH OF ELECTRODE AND WORK CABLES

Cable Length	Cable Size for 125 amp/ 30% Duty Cycle
0-50 feet (0-15 meters)	6 AWG
50-100 feet (15-30 meters)	5 AWG
100-150 feet (30-46 meters)	3 AWG
150-200 feet (46-61 meters)	2 AWG
200-250 feet (61-76 meters)	1 AWG

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Cable Installation

Install the welding cables to your WELDANPOWER 125 as follows. See Figure A.1 for the location of parts.

1. The gasoline engine must be OFF to install welding cables.
2. Remove the 1/2 - 13 flanged nuts from the output terminals.
3. Connect the electrode holder and work cables to the weld output terminals. Normally, the electrode cable is connected to the positive (+) output terminal.
4. Tighten the flanged nuts securely.
5. Be certain that the metal piece you are welding (the "work") is securely connected to the work clamp and cable.
6. Check and tighten the connections periodically.

⚠ CAUTION

- Loose connections will cause the output terminals to overheat. The terminals may eventually melt.
- Do not cross the welding cables at the output terminal connection. Keep the cables isolated and separate from one another.

Lincoln Electric offers a welding accessory kit with the properly specified welding cables. See the ***Accessories*** section of this manual for more information.

MACHINE GROUNDING

Because the WELDANPOWER 125 creates its own power from its gasoline-engine driven generator, you do not need to connect the machine frame to an earth ground. However, for best protection against electrical shock, connect a heavy gauge wire (#8 AWG or larger) from the ground stud located on the bottom center of the output panel (see Figure A.1) to a suitable earth ground such as a metal pipe driven into the ground.

⚠ WARNING

Do not ground the machine to a pipe that carries explosive or combustible material.

When the WELDANPOWER 125 is mounted on a truck or a trailer, the machine generator ground stud MUST be securely connected to the metal frame of the vehicle. See Figure A.1. The ground stud is marked with the symbol.

PLUGS AND HAND-HELD EQUIPMENT

For further protection against electric shock, any electrical equipment connected to the generator receptacles must use a three-blade, grounded type plug or an Underwriter's Laboratories (UL) approved double insulation system with a two-blade plug. Lincoln offers an accessory plug kit that has the right type of plugs. See the ***Accessories*** section of this manual for details.

If you need ground fault protection for hand-held equipment, in-line ground fault current interrupter (GFCI) cord sets that meet UL and OSHA requirements are also available as an option. See the ***Accessories*** section of this manual for details.

AUXILIARY POWER RECEPTACLES

The control panel of the WELDANPOWER 125 features two auxiliary power receptacles:

- A 20 amp, 115 volt duplex (double outlet) receptacle (15 amp CSA).
- A 20 amp 230 volt simplex (single outlet) receptacle (15 amp CSA).

See Figure A.1.

⚠ CAUTION

The 20 amp, 115 volt duplex receptacle is "split phase." Damage will result if you attempt to connect both sides of this receptacle in parallel to a load.

Through these receptacles the machine can supply up to 4,500 watts of single-phase AC power (3500 watts CSA). The machine output voltages meet UL standards and fall within ± 10% of the rated voltage. The output frequency falls within ± 3% of rated frequency (60 Hz).

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PREMISES WIRING

The WELDANPOWER 125 three-wire, grounded neutral generator allows it to be connected to premises wiring. However, the wiring procedure needed to meet the National Electric Code (NEC) regulations as well as city ordinances can be confusing. Matters get worse depending on whether you want the machine to be "hardwired" to the premises or only connected temporarily.

⚠ WARNING

Only a licensed, certified, trained electrician should install the machine to a premises or residential electrical system. Be certain that:

- The premises is isolated and no feedbacking into the utility system can occur. Certain state and local laws require the premises to be isolated before the generator is linked to the premises. Check your state and local requirements.
- A double pole, double throw transfer switch in conjunction with the properly rated double throw circuit breaker is connected between the generator power and the utility meter.

The WELDANPOWER 125 does not have a combined 115/230 volt twist-lock receptacle and cannot be connected to a premises as described in other Lincoln literature.

Remember that the WELDANPOWER 125 is intended only for backup, intermittent use. It cannot withstand long-term use without proper maintenance. See the ***Maintenance*** section of this manual for more information.

Certain electrical devices cannot be powered by the WELDANPOWER 125. Refer to Table A.2 for these devices.

CIRCUIT BREAKERS

The WELDANPOWER 125 has its own 20 amp circuit breakers for overload protection (15 amp CSA). When the machine is operated in high temperature environments, the breakers may tend to trip at lower loads than normally.

⚠ CAUTION

Never bypass the circuit breakers. Without overload protection, the WELDANPOWER 125 could overheat and/or cause damage to the equipment being used.

INSTALLATION

⚠ CAUTION

Certain Electrical devices cannot be powered by the WELDANPOWER 125. See Table A.2.

TABLE A.2
ELECTRICAL DEVICE USE WITH THE WELDANPOWER 125.

Type	Common Electrical Devices	Possible Concerns
Resistive	Heaters, toasters, incandescent light bulbs, electric range, hot pan, skillet, coffee maker.	NONE
Capacitive	TV sets, radios, microwaves, appliances with electrical control.	Voltage spikes or high voltage regulation can cause the capacitative elements to fail. Surge protection, transient protection, and additional loading is recommended for 100% fail-safe operation. **DO NOT RUN THESE DEVICES WITHOUT ADDITIONAL RESISTIVE TYPE LOADS.**
Inductive	Single-phase induction motors, drills, well pumps, grinders, small refrigerators, weed and hedge trimmers.	These devices require large current inrush for starting. (See Table B.3, GENERATOR POWER APPLICATIONS, in the ***Operation*** section of this manual for required starting wattages.) Some synchronous motors may be frequency sensitive to attain maximum output torque, but they SHOULD BE SAFE from any frequency induced failures.
Capacitive/Inductive	Computers, high resolution TV sets, complicated electrical equipment.	An inductive type line conditioner along with transient and surge protection is required, and liabilities still exist. **DO NOT USE THESE DEVICES WITH A WELDANPOWER 125.**

The Lincoln Electric Company is not responsible for any damage to electrical components improperly connected to the WELDANPOWER 125.

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OPERATING INSTRUCTIONS

Read and understand this entire section before operating your WELDANPOWER 125.

SAFETY INSTRUCTIONS

⚠ WARNING

Do not attempt to use this equipment until you have thoroughly read all the operation and maintenance manuals supplied with your machine. They include important safety precautions; detailed engine starting, operating, and maintenance instructions; and parts lists.

ELECTRIC SHOCK can kill.

- Do not touch electrically live parts or electrodes with your skin or wet clothing.
- Insulate yourself from the work and ground.
- Always wear dry insulating gloves.

FUMES AND GASES can be dangerous.

- Keep your head out of fumes.
- Use ventilation or exhaust to remove fumes from breathing zone.

WELDING SPARKS can cause fire or explosion.

- Keep flammable material away.
- Do not weld on containers that have held combustibles.

⚠ WARNING

ARC RAYS can burn.

- Wear eye, ear, and body protection.

ENGINE EXHAUST can kill.

- Use in open, well ventilated areas or vent exhaust to the outside.
- Do not stack anything on or near the engine.

MOVING PARTS can injure.

- Do not operate this equipment with any of its doors open or guards off.
- Stop the engine before servicing it.
- Keep away from moving parts.

Only qualified personnel should install, use, or service this equipment.

GENERAL DESCRIPTION

The WELDANPOWER 125 is a low-cost welder/generator designed for home use and other non-commercial applications. As a welder it provides 125 amps of constant DC current for welding with DC stick electrodes and for DC TIG welding. A single dial provides continuous adjustment of welding output from 50 to 125 amps. As a generator it can supply up to 4500 watts of 115/230 volt, single-phase AC power. The machine is lightweight, portable, and can be lifted easily by two people.

A Briggs & Stratton 9 HP standard Vanguard® air-cooled, gasoline engine powers the welder/generator.

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RECOMMENDED APPLICATIONS

WELDER

The WELDANPOWER 125 provides excellent constant current DC welding output for stick (SMAW) welding and DC TIG welding using the “scratch” starting technique. THE K903 TIG Module can be added as an option to provide high frequency starting. For more details on using the machine as a welder, see WELDING OPERATION in the ***Operation*** section of this manual.

GENERATOR

The WELDANPOWER 125 gives smooth AC generator output for medium use, non-commercial demands. For more details on operating the generator, see GENERATOR OPERATION in the ***Operation*** section of this manual.

OPERATIONAL FEATURES AND CONTROLS

The WELDANPOWER 125 was designed for simplicity. Therefore, it has very few operating controls. A single dial on the control panel lets you select either welder or generator use. For welding, the same dial selects continuous current output over the machine’s 50 to 125 amp range.

The 9 HP Briggs & Stratton gasoline engine controls include a recoil starter, choke, throttle control, and stop switch. See ENGINE OPERATION in the ***Operation*** section of this manual for details about starting, stopping, and breaking in the gasoline engine.

DESIGN FEATURES AND ADVANTAGES

- DC Stick welding (SMAW) process capability with output range from 50 - 125 amps.
- Single-dial current output selection.
- Work and Electrode welding cable mounting terminals.
- 4500 watts of continuous 115/230 volt, single-phase AC auxiliary power (3500 watts CSA).
- Separate ground stud for safe connection of case to earth ground. Single 20 amp, 230 volt generator receptacle.
- Duplex 20 amp, 115 volt generator receptacle.
- Integrated generator output overload protection through two 20 amp circuit breakers.
- Welded-tube, full roll cage frame protects engine and generator/welder.
- Lightweight, portable design.
- Briggs & Stratton 9 HP Vanguard® overhead valve, air-cooled gasoline engine.
- Rubber mounting isolates engine and generator from frame to prevent machine “walking” during use.
- Hour meter standard.
- Automatic shutdown for low oil condition.

WELDING CAPABILITY

The WELDANPOWER 125 is rated 125 amps, 25 volts DC at 30% duty cycle on a ten-minute basis. This means that you can load the welder to 125 amps for three minutes out of every ten-minute period. The machine is capable of higher duty cycles at lower output currents. For example, you can load the welder to 100 amps for six minutes out of ten for a 60% duty cycle.

The current is continuously variable from 50 to 125 amps DC. The WELDANPOWER 125 can, therefore, weld with all 3/32 and most 1/8 inch diameter Lincoln DC electrodes as well as do DC TIG welding.

LIMITATIONS

- The WELDANPOWER 125 is not recommended for any processes besides those that are normally performed using stick welding (SMAW) procedures or TIG welding.
- The WELDANPOWER 125 is not recommended for pipe thawing.
- During welding, generator power is limited to 100 watts, and output voltages can drop from 120 to 80 volts and 240 to 160 volts. Therefore, DO NOT OPERATE ANY SENSITIVE ELECTRICAL EQUIPMENT WHILE YOU ARE WELDING.

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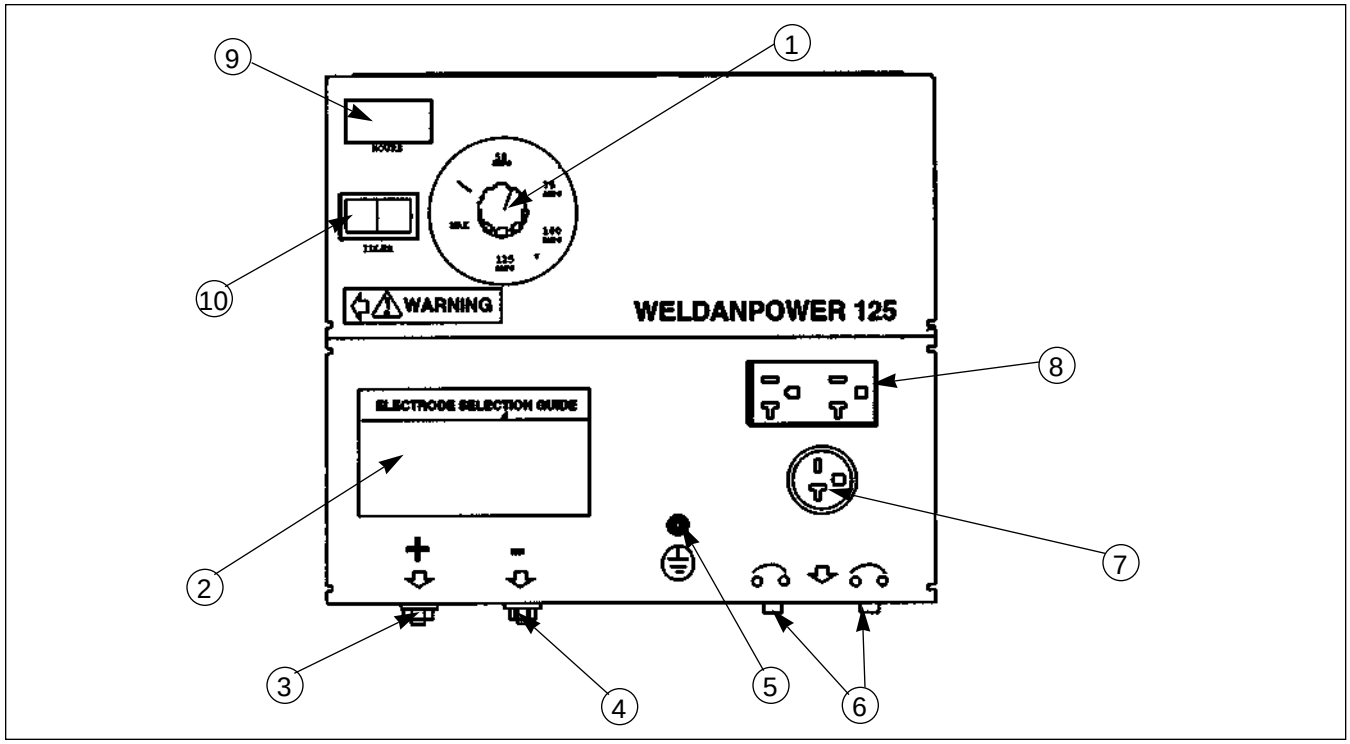
CONTROLS AND SETTINGS

All welder/generators controls are located on the Output Control Panel. Gasoline engine controls are mounted on the engine. See Figures B.1 and B.2 and the explanations that follow.

FIGURE B.1 – OUTPUT PANEL CONTROLS



1. CURRENT CONTROL DIAL
2. ELECTRODE SELECTION GUIDE
3. WELD POSITIVE OUTPUT TERMINAL WITH 1/2 - 13 FLANGE NUT
4. WELD NEGATIVE OUTPUT TERMINAL WITH 1/2 - 13 FLANGE NUT
5. GROUND STUD
6. 20 AMP CIRCUIT BREAKERS (2) (15 AMP CSA)
7. 20 AMP, 230 VOLT RECEPTACLE (15 AMP CSA)
8. 20 AMP, 115 VOLT DUPLEX RECEPTACLE (15 AMP CSA)
9. HOUR METER
10. IDLER CONTROL SWITCH

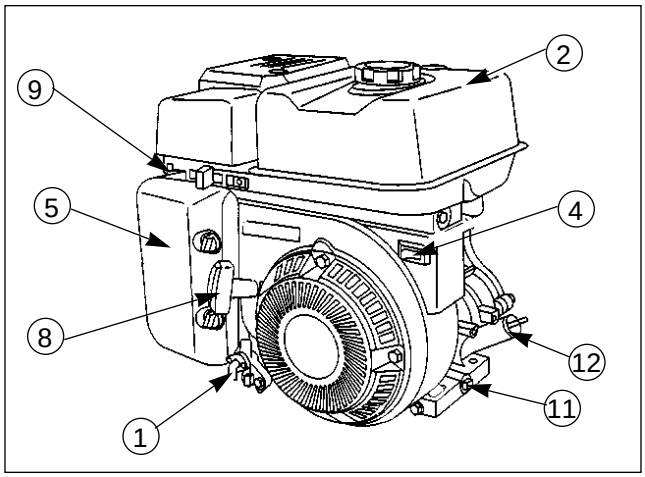
WELDER/GENERATOR CONTROLS

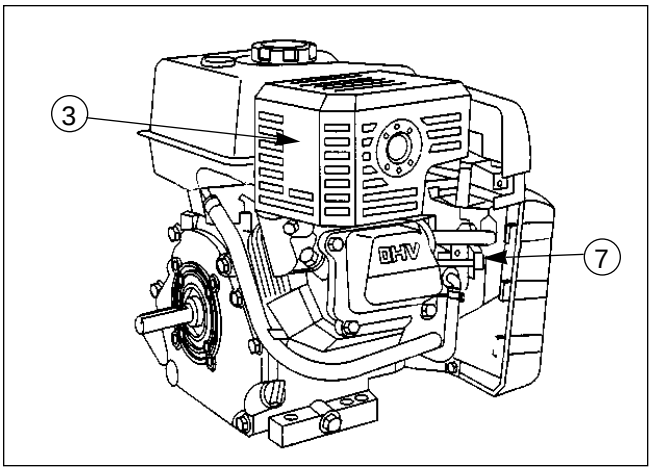
See Figure B.1 for the location of the following features:

1. CURRENT CONTROL DIAL: Adjusts continuous current output. The amperages on the dial correspond to the average amperages needed for specific Lincoln welder rods.
2. ELECTRODE SELECTION GUIDE: Provides recommended electrode type, size, and welder output setting based on the thickness of the work.
3. WELD POSITIVE OUTPUT TERMINAL WITH 1/2 - 13 FLANGE NUT: Provides the connection point for either the electrode holder or the work cable. (For DC+ welding the electrode holder should be connected to the Weld Positive Output Terminal and the work cable to the Weld Negative Output Terminal. For DC– welding the electrode holder should be connected to the Weld Negative Output Terminal and the work cable to the Weld Positive Output Terminal.)
4. WELD NEGATIVE OUTPUT TERMINAL WITH 1/2 - 13 FLANGE NUT: Provides the connection point for either the electrode holder or the work cable. (For DC+ welding the electrode holder should be connected to the Weld Positive Output Terminal and the work cable to the Weld Negative Output Terminal. For DC– welding the electrode holder should be connected to the Weld Negative Output Terminal and the work cable to the Weld Positive Output Terminal.

5. GROUND STUD: Provides a connection point for connecting the machine case to earth ground for the safest grounding procedure.
6. 20 AMP CIRCUIT BREAKERS (2): Provide separate overload current protection for the 115 volt and 230 volt receptacles.
7. 20 AMP, 230 VOLT RECEPTACLE: Connection point for supplying 230 volt power to operate one electrical device.
8. 20 AMP, 115 VOLT DUPLEX RECEPTACLE: Connection point for supplying 115 volt power to operate one or two electrical devices.
9. HOUR METER: Records the engine running time for maintenance purposes.
10. IDLER CONTROL SWITCH: Sets idle speed to FAST IDLE or AUTOMATIC IDLE.

FIGURE B.2 – GASOLINE ENGINE CONTROLS





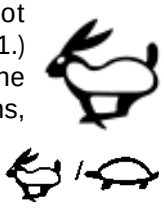
1. FUEL SHUT-OFF VALVE
2. FUEL TANK AND CAP
3. MUFFLER
4. STOP SWITCH/OIL GARD® LIGHT
5. AIR CLEANER
6. IDLER CONTROL SWITCH (NOT SHOWN)
7. CARBURETOR
8. RECOIL STARTER
9. THROTTLE AND CHOKE CONTROLS
10. FUEL MIXTURE ADJUSTMENT SCREW (NOT SHOWN)
11. OIL DRAIN PLUG
12. OIL FILL/DIPSTICK

GASOLINE ENGINE CONTROLS

See Figure B.2 for the location of the following features.

1. FUEL SHUTOFF VALVE: Stops the flow of gasoline from the fuel tank to the carburetor. Should be closed whenever you are finished using the WELDANPOWER 125. Must be opened before you start the engine.
2. FUEL TANK AND CAP: Holds 1.6 gallon (6.0 liters) of unleaded gasoline. Contains a 50 micron fuel filter molded at the outlet port.

   NOTE: If you use any other alternate fuel tank or supply, be sure to use a recommended in-line fuel filter.
3. MUFFLER: Reduces engine noise output. Does not serve as a spark arrester. See SPARK ARRESTER in the ***Installation*** section of this manual.
4. ROCKER STOP SWITCH/OIL GARD® LIGHT: Stops the engine by grounding the ignition circuit. Glows red when engine oil level is low.
5. AIR CLEANER: Filters intake air to the carburetor. See ENGINE MAINTENANCE in the ***Maintenance*** section of this manual for details about the specific type of air cleaner to use.
6. IDLER CONTROL SWITCH: (Not shown. See item 10, Figure B.1.) Adjusts the running speed of the engine. The switch has two positions, HIGH and AUTO. In HIGH, the engine runs continuously at high idle. In AUTO, the idler control works as follows:



   Welding: The engine accelerates to high speed when the electrode touches the work and strikes a welding arc. The engine returns to low idle approximately 12 seconds after welding stops, as long as no auxiliary power is being drawn.

   Auxiliary Power: The engine accelerates to high speed when power is drawn at the receptacles for lights or tools. The engine returns to low idle approximately 12 seconds after demand for auxiliary power stops.

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7. CARBURETOR: Mixes air with fuel to obtain the smoothest operation under load or at idle. The WELDANPOWER 125 is shipped with the proper air/fuel mixture adjustment already set. **DO NOT ADJUST THE AIR MIXTURE WITHOUT FOLLOWING THE PROCEDURES OUTLINED BY BRIGGS & STRATTON.**
8. RECOIL STARTER: Manual, rope-type starter. The handle position allows easy starting from either ground level or pickup-truck level.
9. CHOKE: Provides a richer air/fuel mixture for cold engine starting conditions. See the topic ENGINE OPERATION, below, for details on setting the choke.

10. FUEL MIXTURE ADJUSTMENT SCREW (Not shown): Adjusts the amount of fuel mixed with air to obtain the smoothest operation under load or at idle. The WELDANPOWER 125 is shipped with the proper adjustment already set. **DO NOT ADJUST THE FUEL MIXTURE SCREW WITHOUT FOLLOWING THE PROCEDURES OUTLINED BY BRIGGS & STRATTON.**
11. OIL DRAIN PLUG: Permits convenient draining of engine oil during maintenance. Both sides of the engine are equipped with an oil drain plug.
12. OIL FILL/DIPSTICK: Permits convenient filling of engine oil during maintenance. Both sides of the engine are equipped with an oil fill/dipstick.

ENGINE OPERATION

⚠ WARNING

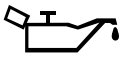
DO NOT RUN THE ENGINE AT EXCESSIVE SPEEDS. The maximum allowable high idle speed for the WELDANPOWER 125 is 3750 RPM, no load. Do NOT adjust the governor screw on the engine. Severe personal injury and damage to the machine can result if it is operated at speeds above the maximum rated speed.

Read and understand all safety instructions included in the Briggs & Stratton **Owner's Manual** that is shipped with the WELDANPOWER 125.

BEFORE STARTING THE ENGINE

CHECK AND FILL THE ENGINE OIL LEVEL:

1. Place the machine on a level surface.



2. Clean around the oil fill, then remove the dipstick.
3. Fill (if necessary) to full mark on the dipstick. Do NOT screw in the dipstick to check.
4. Replace the dipstick and tighten securely. For more details on checking and filling the oil, see ENGINE MAINTENANCE in the ***Maintenance*** section of this manual.

CHECK AND FILL THE ENGINE FUEL TANK:

1. Remove the fuel tank cap.
2. Fill the tank to allow approximately 1/4 inch (5 mm) of tank space for fuel expansion. DO NOT FILL THE TANK TO THE POINT OF OVERFLOW.

3. Replace the fuel tank cap and tighten securely.

NOTE: The engine will operate satisfactorily on any gasoline meant for automotive use. A minimum of 87 octane is recommended. DO NOT MIX OIL WITH THE GASOLINE.

Use clean, fresh, lead-free gasoline. Leaded gasoline may be used if lead-free is not available. However, lead-free gasoline leaves fewer combustion deposits and gives longer valve life. For engine protection from fuel deposits, use Briggs & Stratton Gasoline Additive, part number 5041. Purchase gasoline in quantities that will be used within 30 days, to assure freshness.

NOTE: We DO NOT recommend using gasoline that contains alcohol, such as gasohol. However, if gasoline with alcohol is used, it MUST NOT contain more than 10% Ethanol and MUST be removed from the engine during storage. DO NOT use gasoline containing Methanol.

STARTING THE ENGINE

NOTE: Remove all loads connected to the AC power receptacles before starting the gasoline engine.

FOR A "COLD" ENGINE:

1. Open the fuel shutoff valve on the bottom of the engine, below the recoil starter. Rotate the lever 1/4 turn so that it is in the vertical position and the pointer is on "O." See Figure B.3.
2. Move the choke control to the left. See Figure B.3.

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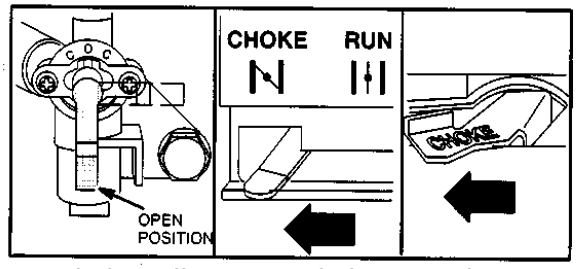
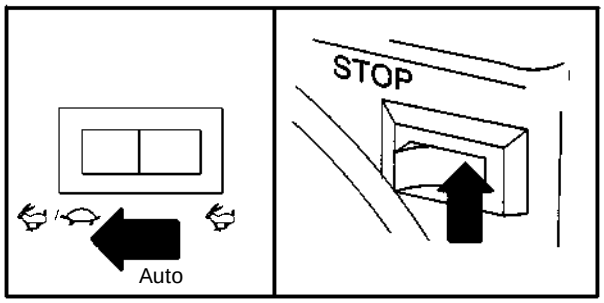
FIGURE B.3
FUEL SHUT-OFF AND CHOKE CONTROL



Fuel Shut-off Choke Controls

3. Set the Idler Control switch to the "AUTOMATIC" position. See Figure B.4.
4. Place the engine stop switch in the "RUN" position. See Figure B.4.
5. Pull slightly on the recoil starter handle until resistance is felt.

FIGURE B.4
IDLER CONTROL AND STOP SWITCH



Idler Control Switch Stop Switch

6. Pull the starter cord rapidly.
7. If the engine does not start, open the choke slightly (move lever right) and pull the starter cord rapidly again.

When the engine starts, immediately open the choke to the right-most position. The engine will go to idle speed after about 12 seconds.

FOR A "HOT" ENGINE:

1. Open the fuel shutoff valve on the bottom of the engine.
2. Place the choke lever in the right-most, position. Closing the choke of a hot engine will flood the carburetor and prevent starting.
3. Pull slightly on the recoil starter handle until resistance is felt.
4. Pull the cord rapidly.

FOR BEST ENGINE STARTING:

- Do not adjust air or fuel mixtures without following the procedures in the Briggs & Stratton **Owner's Manual.**
- Always use fresh gasoline and be sure the filter is clean and properly maintained.
- If you use an alternate fuel tank or supply, be sure to install an in-line fuel filter.
- Do not pull the recoil starter with the choke in the left position more than one time. Repeated pulls on a choked engine will flood the carburetor.
- If you don't feel resistance when you pull the recoil cord, gently hit the starter housing and/or pull the cord out to its fully extended position and wiggle it rapidly. Repeat this if necessary until the clutch engages the shaft and you feel resistance when you pull the cord.
- If the engine will not start, see the ***Troubleshooting*** section of this manual.

STOPPING THE ENGINE

1. Remove all welding and generator power loads and let the engine cool by running it for several minutes.
2. Stop the engine by placing the rocker run/stop switch in the stop position.
3. Close the fuel shutoff valve at the bottom of the engine, below the recoil starter.

⚠ WARNING

Close the fuel valve when the machine is transported to prevent fuel leakage from the carburetor. Drain the tank before transporting the machine in a vehicle.

For long periods of storage, turn off the fuel shutoff valve (horizontal upward position) and let the engine run until there is no more fuel in the line. Use a fuel additive such as Sta-Bil to minimize fuel gum deposits.

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BREAK-IN PERIOD

Any engine will use a small amount of oil during its "break-in" period. For the gasoline engine on the WELDANPOWER 125, break-in is about 50 running hours.

Check the oil frequently during break-in. Change the oil after the first 5 hours of operation. For more details, see the ***Maintenance*** section of this manual.

LOW OIL SENSING

This engine has a built-in sensor that responds to low oil level (not pressure). When activated, the "Oil Gard" system will shut the engine down. The engine will not restart until sufficient oil is added. Check oil level frequently and add oil as required to the full mark on the dipstick. DO NOT OVERFILL.

TABLE B.1
TYPICAL FUEL CONSUMPTION

	Briggs & Stratton 9 H.P. Vanguard
No Load. 2300 R.P.M.	0.15 Gallons/Hour (.57 Liters/Hour)
No Load 3750 R.P.M.	0.33 Gallons/Hour (1.25 Liters/Hour)
DC CC Weld Output 100 Amps, 25 Volts	0.63 Gallons/Hour (2.4 Liters/Hour)
DC CC Weld Output 125 Amps, 25 Volts	0.76 Gallons/Hour (2.9 Liters/Hour)
Auxiliary Power 4500 Watts	0.76 Gallons/Hour (2.9 Liters/Hour)

⚠ CAUTION

During break-in, subject the WELDANPOWER 125 to only moderate loads. Avoid long periods running at idle. Before stopping the engine, remove all loads and allow the engine to cool several minutes.

WELDING OPERATION

GENERAL INFORMATION

⚠ WARNING

Do not touch electrically live parts or electrodes with your skin or wet clothing.

Do not breathe welding fumes or gases.

Use ventilation or exhaust to remove welding fumes from the breathing area.

Keep flammable material away.

Wear eye, ear, and body protection.

Moving parts can injure.

- Do not operate this equipment with any of its doors open or guards off.
- Stop the engine before servicing it.
- Keep away from moving parts.

Only qualified personnel should install, use, or service this equipment.

The WELDANPOWER 125 generator/welder can deliver from 50 to 125 amps of continuous welding output current. Output can be adjusted by setting the current control dial on the output control panel.

You can get maximum welding output by setting the dial to 125 AMPS. At high current settings like this, some output may decrease as the machine is used. If you are welding for a long time, you may need to turn the dial slightly upward to maintain the same results.

The numbers on the dial correspond to the average amps needed to weld using specific Lincoln welding rods. Table B.2, ELECTRODE SELECTION GUIDE, gives you the recommended dial settings based on the thickness of the work and the size and type of rod you're using.

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TO USE THE WELDANPOWER 125 FOR WELDING:

1. Remove the flange nuts from the weld output terminals and place the work and electrode welding cables over the terminals. See Figure B.2. Replace and tighten the flange nuts securely. Be sure the connections are tight.
2. Select the appropriate electrode. See Table B.2, ***Electrode Selection Guide***. This same table is also printed on the machine Output Control Panel.
3. Attach the work clamp securely to the work you are welding.
4. Insert the electrode into the electrode holder.
5. Set the current control dial to the desired output current.
6. Start the gasoline engine. See ***Engine Operation*** in this section of the manual.
7. Strike an arc and begin welding.

AFTER YOU FINISH THE WELD:

1. Stop the gasoline engine. See ***Engine Operation*** in this section of the manual.
2. Allow the electrode and work to cool completely.
3. Remove the work clamp from the work.
4. Remove any remaining piece of electrode from the electrode holder.
5. If you are finished using the WELDANPOWER 125 for welding, disconnect the welding cables from the weld output terminals. Reattach the flange nuts and leave them on the terminals.

For DC+ welding, connect the electrode cable to the "+" output terminal and the work cable to the "-" output terminal. For DC - welding, reverse these connections.

TIG WELDING

⚠ CAUTION

Improper use of high frequency equipment may damage this machine. Use only the recommended equipment.

The WELDANPOWER 125 can be used for DC TIG welding using the "scratch" technique.

For high frequency starting, use the K930-1 TIG Module.

TABLE B.2
ELECTRODE SELECTION GUIDE

AWS CLASSIFICATION	ELECTRODE TYPE	ELECTRODE POLARITY	CURRENT RANGE (AMPS)		
			3/32 SIZE	1/8 SIZE	5/32 SIZE
6010	FLEETWELD® 5P	+	50-75	75-125	-
6011	FLEETWELD® 35	+	50-75	70-110	80-125
6011	FLEETWELD® 180	+	50-80	55-110	105-125
6013	FLEETWELD® 37	±	70-95	100-125	-
7018	JETWELD® LH-70	+	70-100	90-125	-
7018	JETWELD® LH-73	+	65-85	90-125	-
308-16	STAINWELD® 308-16	+	50-60	55-95	80-125
ENi-CI	SOFTWELD® 99NI	+	50-80	80-110	-
ABW	ABRASOWELD™	+	-	50-125	-
MATERIAL THICKNESS			1/8 AND THINNER	1/8 AND THICKER	

NOTES:

The values listed are suggested settings. Actual setting may vary depending on individual preference and/or specific application. Beginners should use STABLE ARC E7018.

For electrodes not listed, follow tables that are packed with the electrodes.

Ask for the Lincoln WELD DIRECTORY (Publication M210) for a complete listing of all Lincoln stick electrodes available.

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AUXILIARY POWER

⚠ CAUTION

Be sure that any electrical equipment plugged into the generator's AC power receptacles can withstand a ±10% voltage and a ±3% frequency variation. Some electronic devices cannot be powered by the WELDANPOWER 125. Refer to Table A.2, ELECTRICAL DEVICE USE WITH THE WELDANPOWER 125, in the INSTALLATION section of this manual.

GENERAL INFORMATION

The WELDANPOWER 125 generator is rated at 4500 continuous watts (3500 watts CSA). It provides both 115 volt and 230 volt power. You can draw up to 20 amps from either side of the 115 volt duplex receptacle, but no more than 37 amps from both sides at once. Up to 18 amps can be drawn from the single 230 volt receptacle.

⚠ CAUTION

The 115 volt duplex receptacle is "split phase." Damage will result if you attempt to connect both sides of this receptacle in parallel to a load.

Electrical loads in watts are calculated by multiplying the voltage rating of the load by the number of amps it draws. (This information is given on the load device nameplate.) For example, a device rated 115 volts, 2 amps will need 230 watts of power (115 x 2 = 230).

You can use Table B.3, GENERATOR POWER APPLICATIONS, to determine the wattage requirements of the most common types of loads you can power with the WELDANPOWER 125. Be sure to read the notes at the bottom of the table.

TO USE THE WELDANPOWER 125 AS AN AUXILIARY POWER SUPPLY:

1. Start the gasoline engine. See ***Engine Operation*** in this section of the manual.
2. Set the current control dial on the output control panel to "MAX."
3. Plug the load(s) into the appropriate 115 volt or 230 volt power receptacle.

NOTE: During welding, the maximum generator output for auxiliary loads is 100 watts.

NOTE: You can supply multiple loads as long as they are isolated from each other and the total load does not exceed 4,500 watts (3500 watts CSA). Be sure to start the largest loads first.

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TABLE B.3
GENERATOR POWER APPLICATIONS

Suggested Power Applications	Running Watts	*Start-up Watts
*Air Compressor - 3/4 HP	1,250	3,100 - 5,000
*Airless Sprayer - 1/3 HP	600	1,500 - 2,400
Chain Saw	1,200	
Circular Saw	1,200	
Coffee Maker	1,000	
*Deep Freezer	500	750 - 2,000
*Electric Motor - 1 HP	1,000	2,500 - 4,000
Electric Range (1 element)	1,500	
Electric Skillet	1,250	
* Furnace Fan - 1/3 HP	1,200	3,000 - 4,800
Portable Grinder (4-1/2”)	600	
Portable Grinder (7”)	2,000	
Halogen Work Light	500	
Hand Drill - 1/4”	500	
Hand Drill - 3/8”	700	
1500 Watt Heater	1,750	
Hedge Trimmer	450	
Light Bulb	100	
Reciprocating Saw	900	
Radial Arm Saw	2,600	
Radio	50	
*Refrigerator/Freezer (small)	600	1,500 - 2,400
Slow Cooker	200	
*Submersible Pump - 1HP	1,000	2,500 - 4,000
*Sump Pump	600	1,500 - 2,400
Toaster	1,100	
Weed Trimmer	500	
Lincoln 100 or 125 Amp Wire Feeder/Welder	4,000	

NOTES:

Wattages listed are approximate. Check your equipment for actual wattage.

Equipment with unusually high *START-UP WATTS are listed. For start-up of other equipment listed in the table, multiply RUNNING WATTS by 2.

Multiple loads can be used as long as the total load does not exceed 4,500 watts (3,500 watts CSA) and they are isolated from each other. Be sure to start the largest loads first. For example, a 1 HP motor needs approximately 1,000 watts while running but may require 2,500 watts to start. Some inductive motors may require as much as 4 times running watts to start.

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OPTIONS/ACCESSORIES

LINCOLN ELECTRIC ACCESSORIES

The following options/accessories are available for your WELDANPOWER 125 from your local Lincoln Distributor.

Power Plug Kit (K802-U) – Provides three plugs, two for the 115 volt duplex receptacle and one for the 230 volt receptacle. (Order Power Plug Kit K802-T for the CSA model.)

Accessory Set (K875) – Includes the following:

- Twenty feet (6.1 meters) of #6 AWG electrode cable
- Fifteen feet (4.6 meters) of #6 work cable
- Headshield with No. 10 filter, work clamp
- Insulated electrode holder and sample electrodes

The cables are rated at 150 amps, 40% duty cycle.

GFCI Receptacle Kit (K896-3) – Includes one UL approved 115 volt ground fault circuit interruptor duplex type receptacle with cover and installation instructions. Replaces the factory installed 115 volt receptacle. Each side of the GFCI duplex is rated 15 amps, but the maximum total current from the duplex is limited to 20 amps.

Undercarriage (K882-2) – A two-wheeled, hand movable undercarriage. Field installed.

BRIGGS AND STRATTON ACCESSORIES

The following options/accessories are available for your WELDANPOWER 125 from your local Briggs & Stratton Distributor.

Exhaust Deflector (REF 710281) – Directs exhaust either right, left, or downward, away from the operator.

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SAFETY PRECAUTIONS

⚠ WARNING

- Have qualified personnel do all maintenance and troubleshooting work.
- Turn the engine off before working inside the machine.
- Remove guards only when necessary to perform maintenance and replace them when the maintenance requiring their removal is complete.
- If guards are missing from the machine, get replacements from a Lincoln Distributor.

Read the Safety Precautions in the front of this manual and in the Briggs & Stratton **Owner's Manual** before working on the WELDANPOWER 125.

Keep all equipment safety guards, covers, and devices in position and in good repair. Keep your hands, hair, clothing, and tools away from the recoil housing, fans, and all other moving parts when starting, operating, or repairing this machine.

ROUTINE AND PERIODIC MAINTENANCE

ENGINE MAINTENANCE

⚠ CAUTION

To prevent the engine from accidentally starting, disconnect the spark plug lead before servicing the engine.

See Table D.1 for a summary of maintenance intervals for the items listed below. Follow either the hourly or the calendar intervals, whichever come first. More frequent service may be required, depending on your specific application and operating conditions. Table D.2 shows engine maintenance replacement parts and numbers.

OIL: Check the oil level after every 5 hours of operation or daily. BE SURE TO MAINTAIN THE OIL LEVEL. Change the oil the first time after 5 hours of operation. Then, under normal operating conditions, change the oil after every 50 hours or once a year, whichever occurs first. If the engine is operated under heavy load or in high ambient temperatures, change the oil every 25 hours.

Drain the oil from the drain plug located on the engine bottom, as shown in Figure D.1. Refill through the oil fill until the oil reaches the FULL mark on the dipstick. See Figure D.2. Use SAE 10W-30 grade oil.

FIGURE D.1 - OIL DRAIN AND REFILL LOCATION

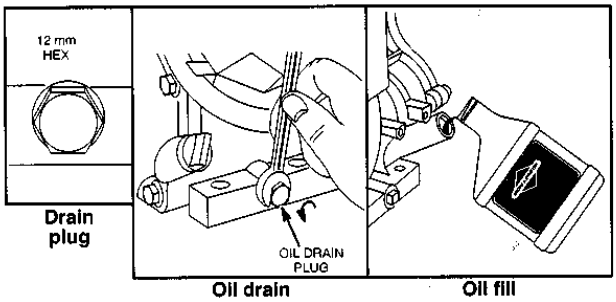
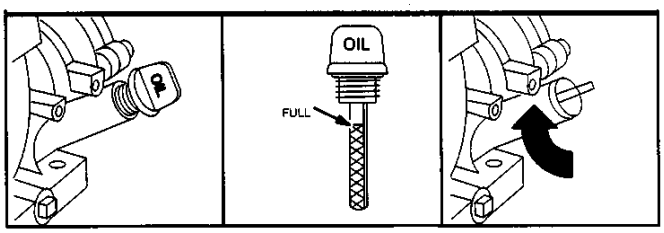


FIGURE D.2 - OIL CHECK PROCEDURE



Do not screw in dipstick to check oil | Fill to FULL mark on dipstick - recheck | Tighten dipstick firmly before starting

FUEL: At the end of each day's use, refill the fuel tank to minimize moisture condensation and dirt contamination in the fuel line.

MAINTANENCE

AIR CLEANER: With normal operating conditions, the maintenance schedule for cleaning and re-oiling the foam pre-filter is every 25 hours and replacement of the air cleaner filter element every 100 hours. More frequent servicing is required with dusty operating conditions.

⚠ CAUTION

Do not use petroleum solvents such as kerosene to clean the cartridge. They may cause deterioration of the cartridge. DO NOT OIL THE CARTRIDGE OR USE PRESSURIZED AIR TO CLEAN OR DRY THE CARTRIDGE.

Remove the wing nuts and cover. Carefully remove the foam pre-cleaner from the cartridge.

To service the pre-cleaner:

1. Wash in liquid detergent and water.
2. Squeeze dry in a clean cloth.
3. Saturate in clean engine oil.
4. Squeeze in a clean, absorbent cloth to remove all excess oil.

To service the cartridge:

1. Tap gently on a clean surface.
2. Replace if very dirty or wash in a non-sudsing detergent and warm water solution.
3. Rinse thoroughly from the mesh side with flowing water until the water is clear.
4. Allow to stand and air dry before reinstalling.

Carefully place the pre-cleaner back over the cartridge and reinstall the air cleaner cover and wingnuts.

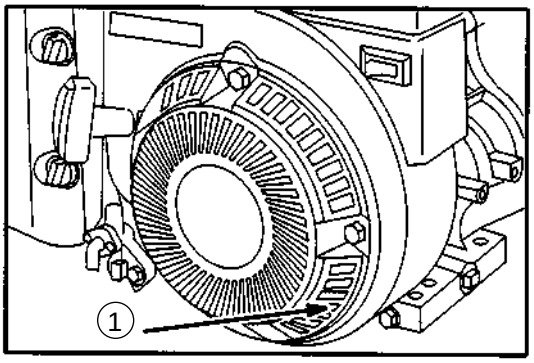
CLEAN ENGINE: Remove dirt and debris with a cloth or a brush. Do not clean with a forceful spray of water. Water might contaminate the fuel system.

⚠ CAUTION

Periodically clean the muffler area to remove combustible debris.

Clean Rotating Screen: See Figure D.3. Clean the rotating screen on your machine's engine as often as needed to remove dirt or debris that may collect on the screen. A dirty screen can result in engine overheating and damage.

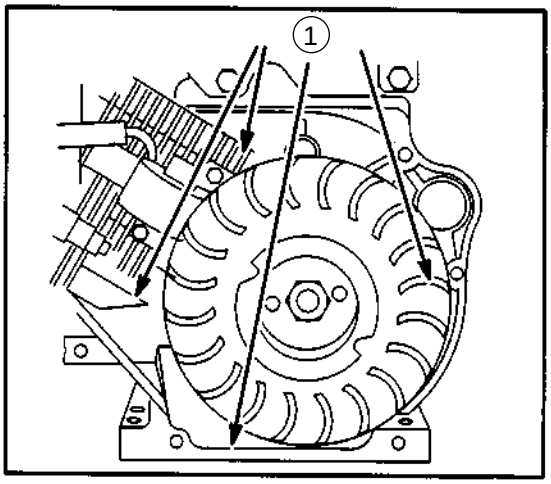
FIGURE D.3 - CLEAN FINGER GUARD



1. FINGER GUARD

CLEAN COOLING SYSTEM: See Figure D.4. Clean the internal cooling fins and surfaces to prevent overspeeding, overheating, and engine damage. Clean every 100 operating hours or as often as necessary.

FIGURE D.4- CLEAN COOLING SYSTEM



1. REMOVE CHAFF AND DIRT FROM THESE AREAS.

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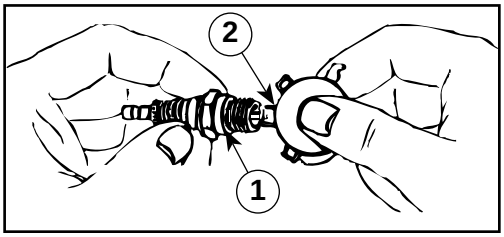
MAINTENANCE

CLEAN OR REPLACE SPARK PLUG: Clean or replace the spark plug after every 100 hours of operation or every season, whichever comes first. Do not blast the spark plug clean with an abrasive cleaning device. Clean the plug by scraping it or by using a wire brush. Wash the plug with a commercial solvent. After cleaning or when installing a new spark plug, set the terminal gap to .030 inch (.76 mm) with a feeler gauge. See Figure D.5.

REMOVE COMBUSTION DEPOSITS: After every 100 hours of properly, remove the engine cylinder head. Scrape and wire brush the combustion deposits from the cylinder, cylinder head, top of the piston, and around the valves. Refit the gasket (replace it if damaged) and reassemble the cylinder head and block. Turn down the screws finger tight. Torque the screws in a staggered sequence to 165 inch-pounds (19 N·m).

FIGURE D.5 - SET SPARK PLUG GAP



1. SPARK PLUG (RESISTOR, PART NO. 491055)
2. FEELER GAUGE (.030 INCH, 76mm)

TABLE D.1
ENGINE MAINTENANCE SCHEDULE

Maintenance Operation	Every 8 Hours or Daily	25 Hours or Yearly	50 Hours or Yearly	100 Hours or Yearly
Check Oil Level	●			
Change Oil ◆			● Note 1	
Clean Finger Guard	● Note 2			
Service Foam Pre-Cleaner		● Note 2		
Service Air Cleaner Cartridge				● Note 2
Clean Cooling System				● Note 2
Clean or Replace Spark Plug				●
Clean Fuel Filter			●	
Remove Combustion Deposits				●

◆ Change oil after first 5 hours, then after every 50 hours or once a year.
Note 1: Change oil every 25 hours when operating under heavy load in high ambient temperatures.
Note 2: Clean more often under dusty conditions or when airborne debris is present.

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TABLE D.2 – ENGINE MAINTENANCE PARTS

Part	Part Number
OIL FILTER	NONE
SPARK PLUG (STANDARD)	B&S 492167
SPARK PLUG (RESISTOR)	B&S 491055 CHAMPION RC12YC
AIR CLEANER CARTRIDGE	B&S 710266 (CAN BE CLEANED AND REUSED)
AIR PRE-CLEANER (AS NEEDED)	B&S 710268 (CAN BE CLEANED AND REUSED)

WELDER/GENERATOR MAINTENANCE

STORAGE: Store the WELDANPOWER 125 in clean, dry, protected areas.

CLEANING: Blow out the generator and controls periodically with low pressure air. Do this at least once a week in particularly dirty areas.

BRUSH REMOVAL AND REPLACEMENT: See Figure D.6. It's normal for the brushes and slip rings to wear and darken slightly. Inspect the brushes when a generator overhaul is necessary. Remove the brushes and clean the slip rings with fine grit sandpaper.

⚠ CAUTION

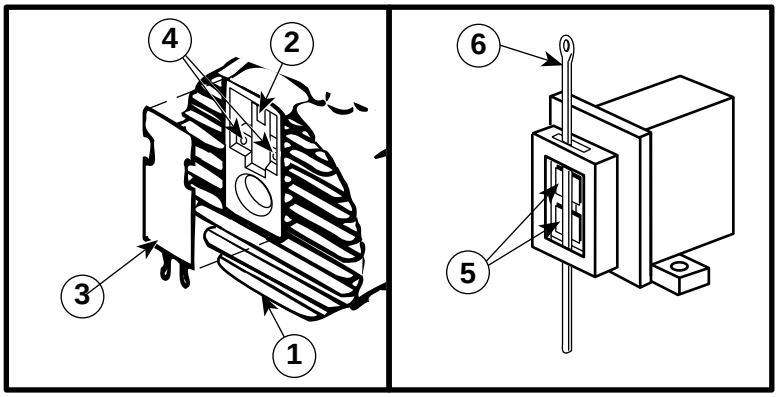
Do not attempt to polish slip rings while the engine is running.

To reinstall the brushes, press them upward and slide a cable tie or wooden stick through the brush holder tabs. Install the brush holder into the bearing end bracket and secure with the screws previously removed. Remove the cable tie or wooden stick and the brushes will seat onto the slip rings.

RECEPTACLES: Keep the electrical receptacles in good condition. Remove any dirt, oil, or other debris from their surfaces and holes.

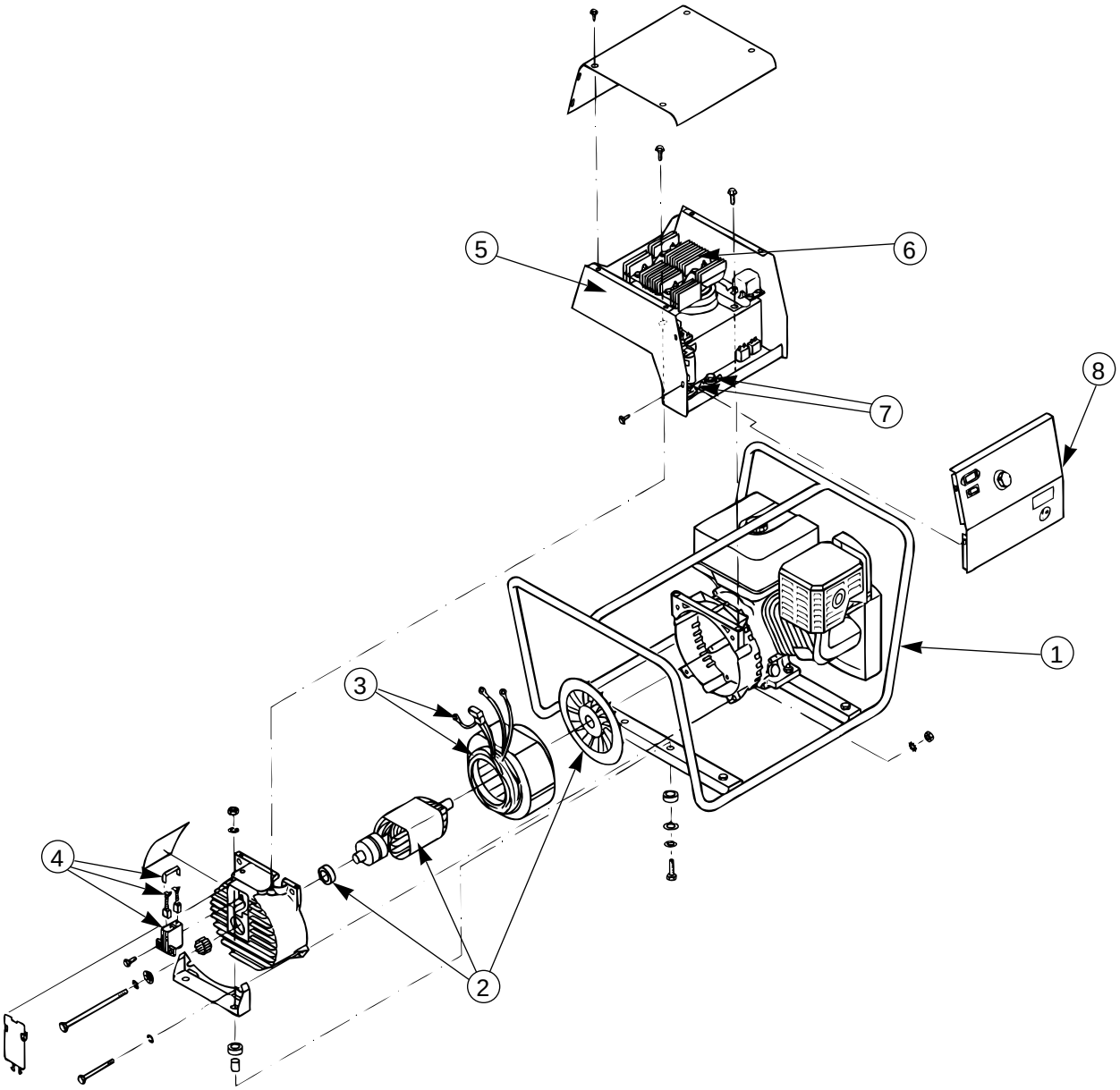
CABLE CONNECTIONS: Check the welding cable connections at the weld output terminals often. Be sure that the connections are always firm.

FIGURE D.6 – BRUSH REMOVAL AND REPLACEMENT



1. GENERATOR END BRACKET
2. BRUSH HOLDER ASSEMBLY
3. COVER
4. SCREWS (2)
5. BRUSHES
6. CABLE TIE

FIGURE D.6 – MAJOR COMPONENT LOCATIONS



1. CRADLE ASSEMBLY
2. ROTOR, BLOWER, AND BEARING ASSEMBLY
3. STATOR ASSEMBLY
4. BRUSH AND BRUSH HOLDER ASSEMBLY
5. CONTROL BOX WELDED ASSEMBLY
6. OUTPUT RECTIFIER ASSEMBLY
7. OUTPUT TERMINAL ASSEMBLY
8. OUTPUT PANEL ASSEMBLY

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FIGURE E.1 – WELDANPOWER 125 BLOCK LOGIC DIAGRAM

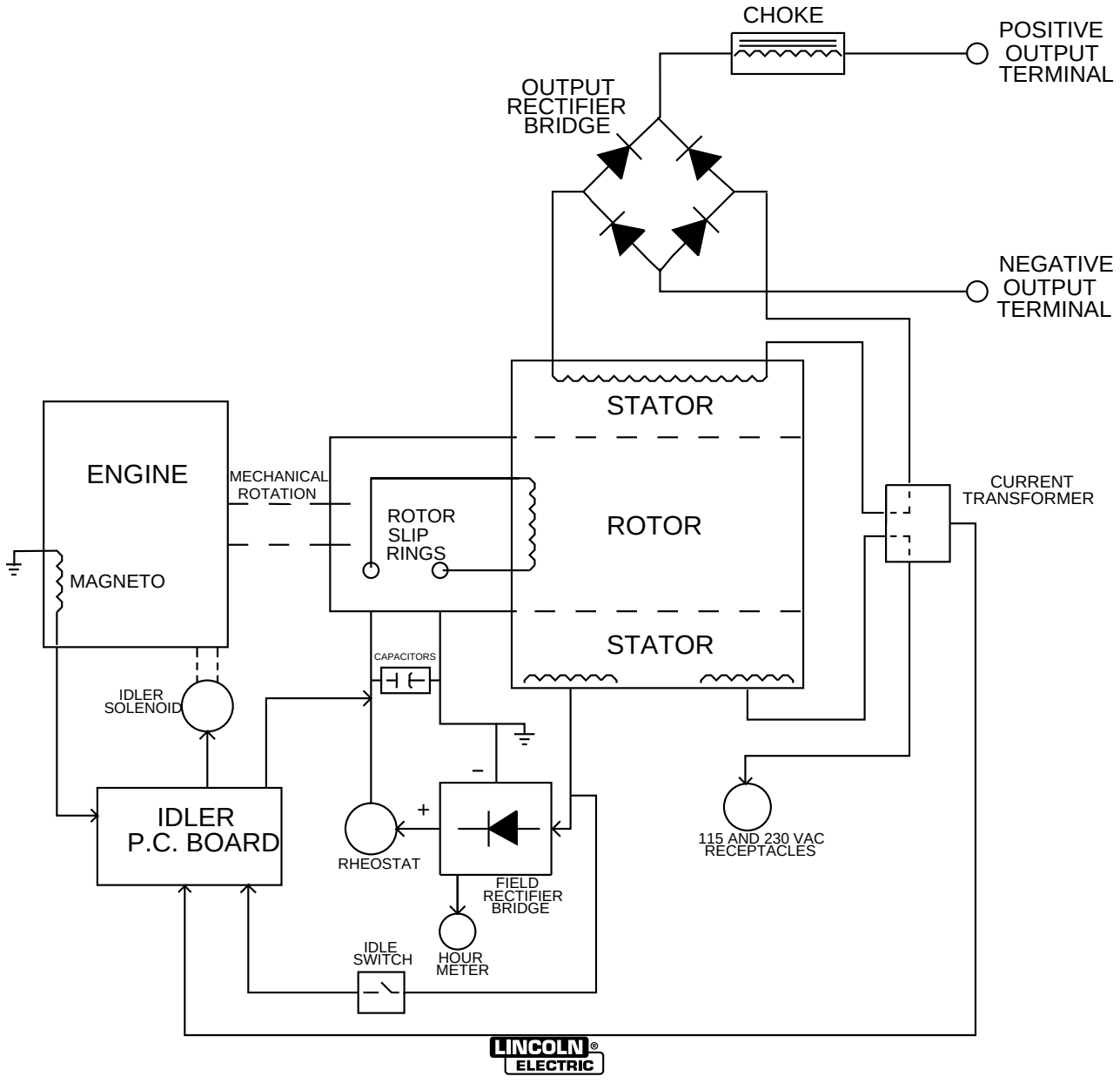

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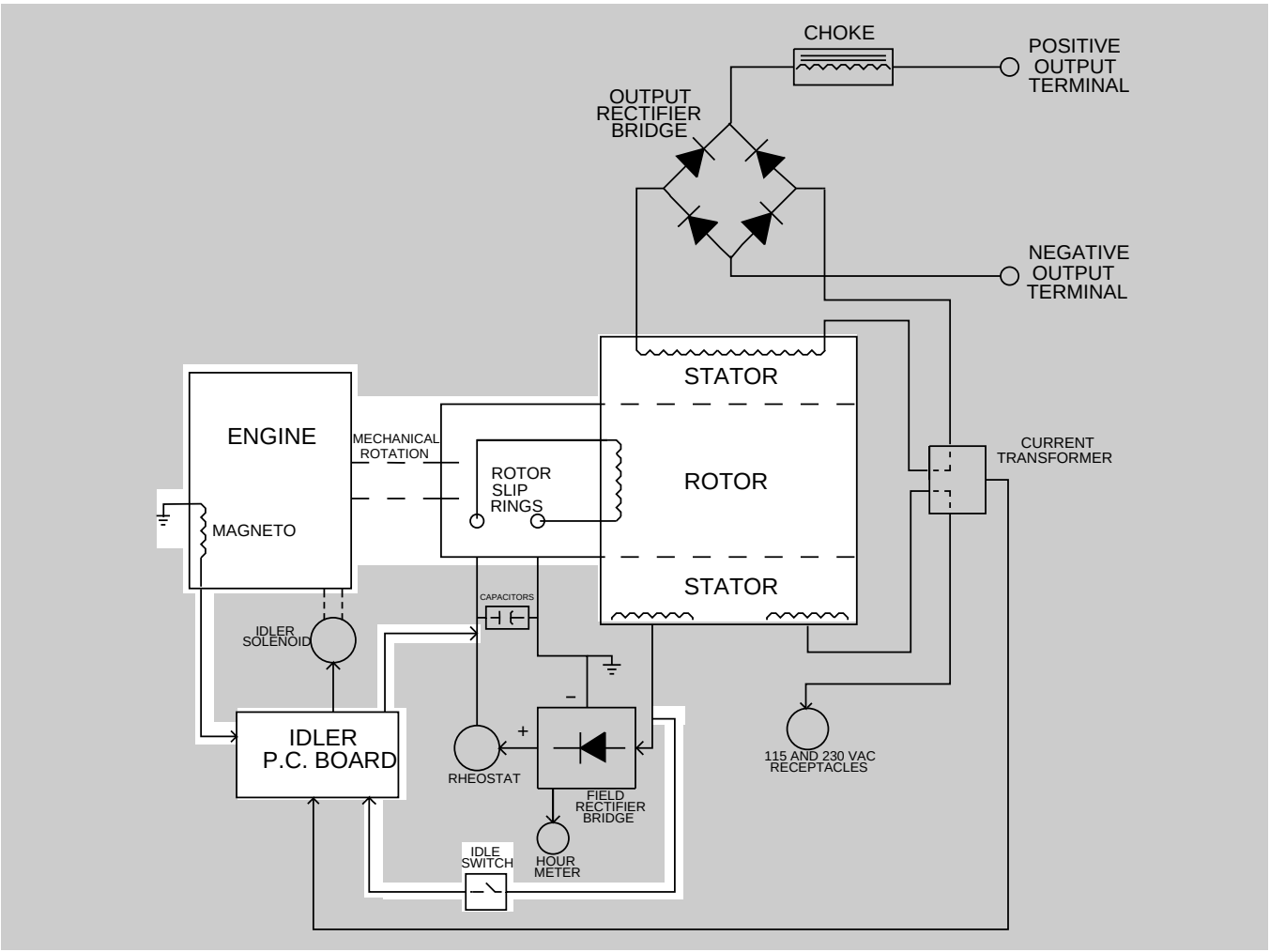
FIGURE E.2 – ENGINE, EXCITATION, ROTOR AND STATOR



ENGINE, EXCITATION, ROTOR AND STATOR

A small voltage developed by the engine magneto is rectified on the idler P.C. board and fed to the rotating field coil in the rotor via a brush and slip ring configuration. This excitation (“flashing”) voltage magnetizes the rotor lamination. The rotor is mechanically coupled to the engine. The rotating magnet induces a voltage in the stationary windings of the main alternator (stator).

Three separate and isolated windings are incorporated in the stator lamination assembly. Each winding set has a different number of turns, producing different magnitudes of AC output voltages. The three windings are the weld winding, the auxiliary power winding and the field feedback winding. The field feedback winding provides rotor current during machine operation, and, through the idle switch, supplies power to the idler board. The output of the WELDANPOWER 125 is dependent on two criteria: the engine RPM and the amount of current in the rotor winding.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

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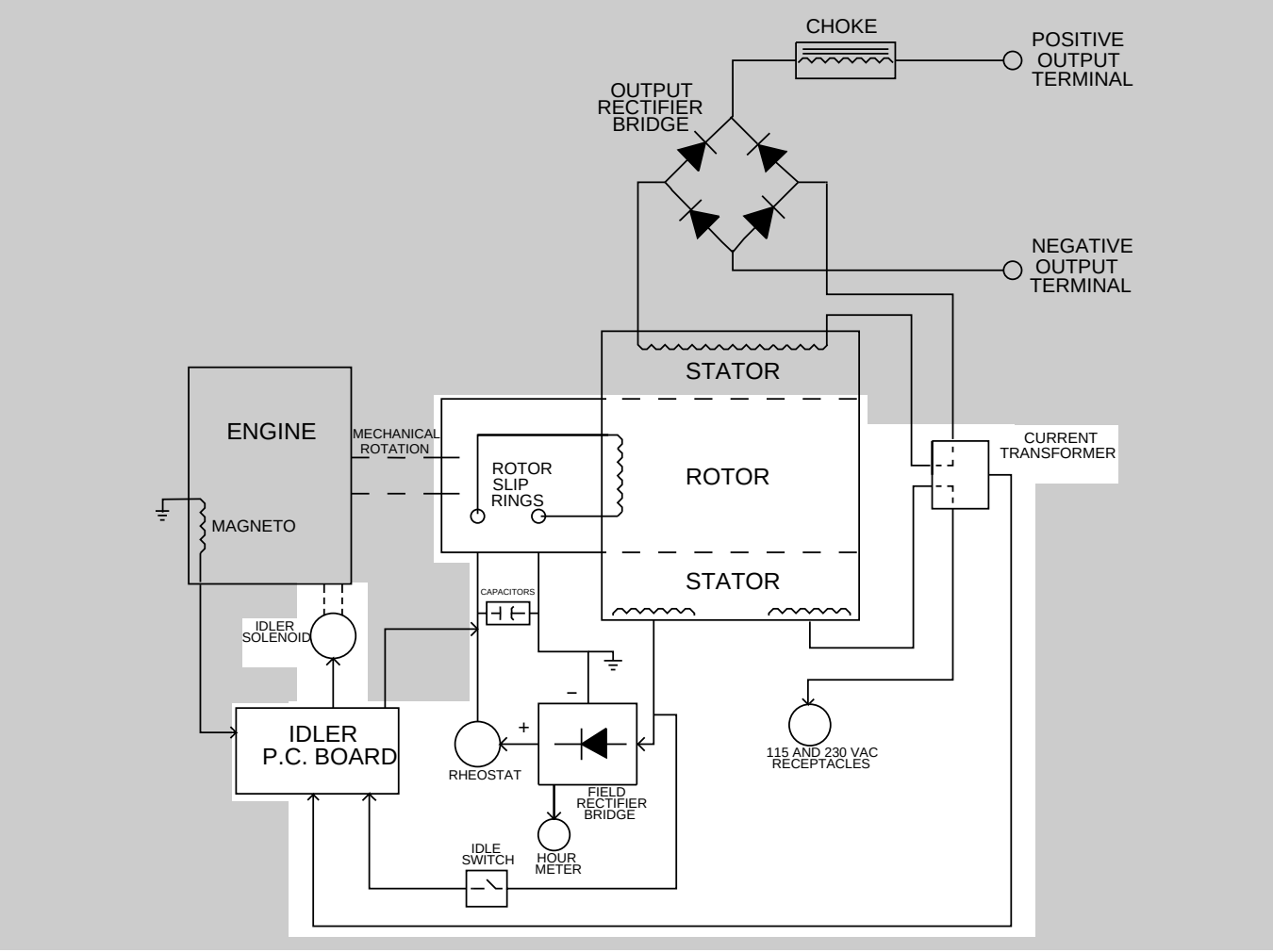
FIGURE E.3 – ROTOR FIELD FEEDBACK, AUXILIARY POWER AND ENGINE IDLE CONTROL



ROTOR FIELD FEEDBACK, AUXILIARY POWER AND ENGINE IDLE CONTROL

The AC voltage developed in the field winding is fed to the full wave rectifier bridge. The DC output of the bridge is filtered by the field capacitor and controlled by the output rheostat. This filtered and controlled feedback voltage is fed to the rotor winding via the brush and slip ring configuration. As the feedback voltage is increased or decreased, the outputs of the weld and auxiliary windings are likewise increased or decreased.

The hour meter is also powered by the field rectifier bridge. When field voltage is present, the hour meter will run.

When full field voltage is applied to the rotor and the engine is running at high speed (3700 RPM), a 230VAC voltage is developed in the stator auxiliary winding. This winding is tapped. Each half of this winding provides 115 VAC to each side of the 115V duplex receptacle. The two voltages (115VAC and 230VAC) are connected to the appropriate receptacles and offer 4500 watts (total) of AC power.

The idler solenoid is mechanically connected to the engine throttle linkage. The field winding provides power for the idler P.C. board and also to the idler solenoid, which brings the engine to a low idle state. When output current, either weld or auxiliary, is sensed by the current transformer, the P.C. board deactivates the idler solenoid, and the engine returns to high RPM.

AUXILIARY POWER OVERCURRENT PROTECTION

The 4500 watt auxiliary power winding and circuitry is protected from an overload condition by two 20 amp circuit breakers. The circuit breakers are located below the output receptacles. They can be manually reset.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

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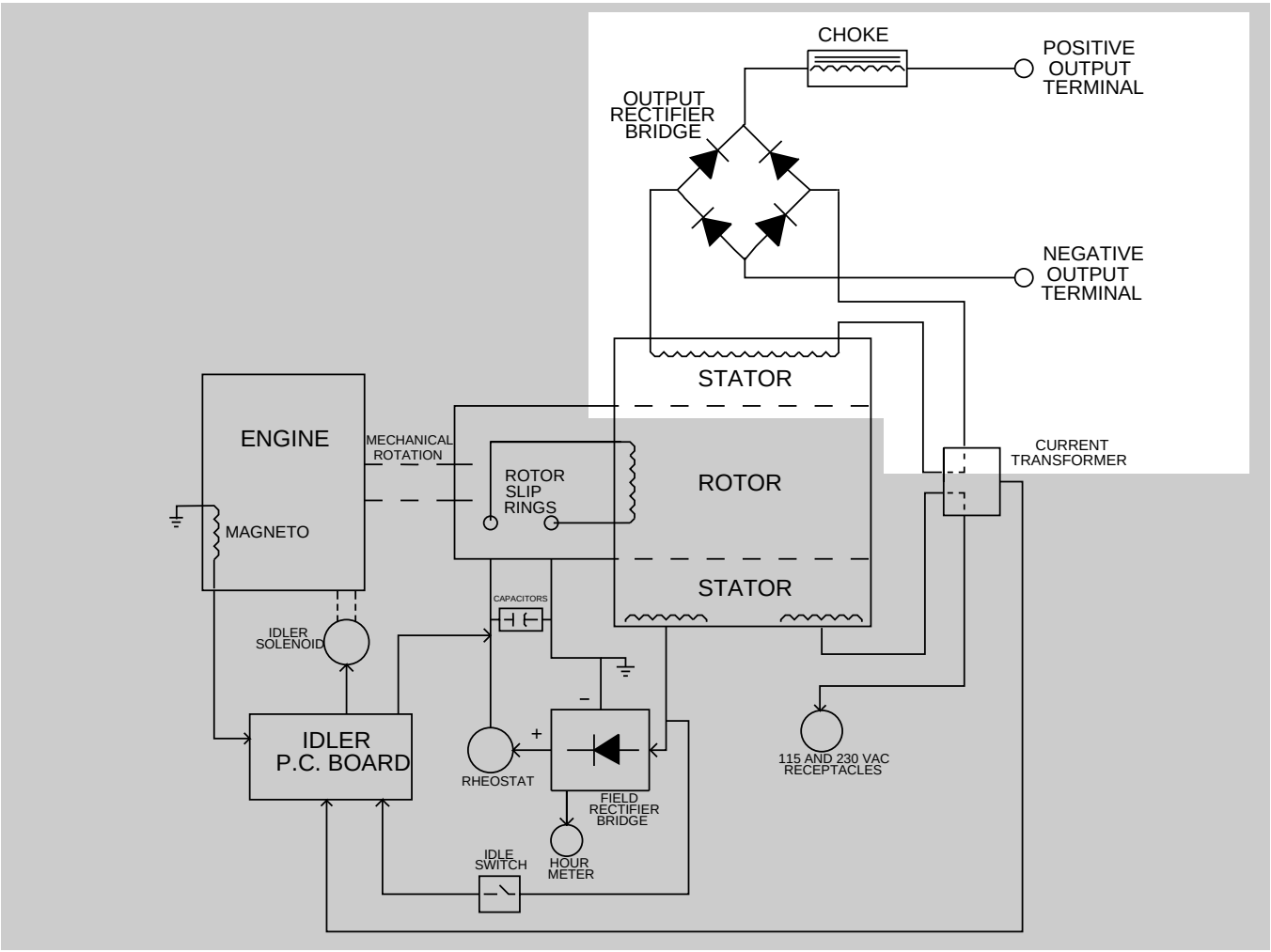
FIGURE E.4 – WELD WINDING, OUTPUT RECTIFIER AND CHOKE



WELD WINDING, OUTPUT RECTIFIER AND CHOKE

The AC voltage developed in the stator weld winding is delivered through the current transformer to the output rectifier bridge, where the AC voltage is rectified to a DC voltage. The DC current path from the output of the rectifier bridge is through the choke, where the DC is filtered, to the negative and positive output terminals.

The WELDANPOWER 125 provides 125 amps of constant current DC welding for stick electrodes.

NOTE: Unshaded areas of Block Logic Diagram are the subject of discussion.

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TROUBLESHOOTING & REPAIR

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and repair should be performed by only Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM). Look under the column labeled "PROBLEM (SYMPTOMS). This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting. Symptoms are grouped into three main categories: Output Problems, Engine Problems, and Welding Problems.

Step 2. PERFORM EXTERNAL TESTS. The second column, labeled "POSSIBLE AREAS OF MISADJUSTMENT(S)", lists the obvious external possibilities that may contribute to the machine symptom. Perform these tests/checks in the order listed. In general, these tests can be conducted without removing the case wrap-around cover.

Step 3. PERFORM COMPONENT TESTS. The last column, labeled "Recommended Course of Action" lists the most likely components that may have failed in your machine. It also specifies the appropriate test procedure to verify that the subject component is either good or bad. If there are a number of possible components, check the components in the order listed to eliminate one possibility at a time until you locate the cause of your problem.

All of the referenced test procedures referred to in the Troubleshooting Guide are described in detail at the end of this chapter. Refer to the Troubleshooting and Repair Table of Contents to locate each specific Test Procedure. All of the referred to test points, components, terminal strips, etc., can be found on the referenced electrical wiring diagrams and schematics. Refer to the Electrical Diagrams Section Table of Contents to locate the appropriate diagram.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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TROUBLESHOOTING & REPAIR

PC BOARD TROUBLESHOOTING PROCEDURES

⚠ WARNING

ELECTRIC SHOCK can kill.

Have an electrician install and service this equipment. Turn the machine OFF before working on equipment. Do not touch electrically hot parts.

Sometimes machine failures appear to be due to PC board failures. These problems can sometimes be traced to poor electrical connections. To avoid problems when troubleshooting and replacing PC boards, please use the following procedure:

1. Determine to the best of your technical ability that the PC board is the most likely component causing the failure symptom.
2. Check for loose connections at the PC board to assure that the PC board is properly connected.
3. If the problem persists, replace the suspect PC board using standard practices to avoid static electrical damage and electrical shock. Read the warning inside the static resistant bag and perform the following procedures:

ATTENTION
Static-Sensitive Devices
Handle only at Static-Safe Workstations

Reusable Container
Do Not Destroy

PC Board can be damaged by static electricity.

- Remove your body's static charge before opening the static-shielding bag. Wear an anti-static wrist strap. For safety, use a 1 Meg ohm resistive cord connected to a grounded part of the equipment frame.
- If you don't have a wrist strap, touch an unpainted, grounded, part of the equipment frame. Keep touching the frame to prevent static build-up. Be sure not to touch any electrically live parts at the same time.
- Tools which come in contact with the PC Board must be either conductive, anti-static or static-dissipative.
- Remove the PC Board from the static-shielding bag and place it directly into the equipment. Don't set the PC Board on or near paper, plastic or cloth which could have a static charge. If the PC Board can't be installed immediately, put it back in the static-shielding bag.
- If the PC Board uses protective shorting jumpers, don't remove them until installation is complete.
- If you return a PC Board to The Lincoln Electric Company for credit, it must be in the static-shielding bag. This will prevent further damage and allow proper failure analysis.

4. Test the machine to determine if the failure symptom has been corrected by the replacement PC board.

NOTE: Allow the machine to heat up so that all electrical components can reach their operating temperature.

5. Remove the replacement PC board and substitute it with the original PC board to recreate the original problem.
   a. If the original problem does not reappear by substituting the original board, then the PC board was not the problem. Continue to look for bad connections in the control wiring harness, junction blocks, and terminal strips.
   b. If the original problem is recreated by the substitution of the original board, then the PC board was the problem. Reinstall the replacement PC board and test the machine.
6. Always indicate that this procedure was followed when warranty reports are to be submitted.

NOTE: Following this procedure and writing on the warranty report, "INSTALLED AND SWITCHED PC BOARDS TO VERIFY PROBLEM," will help avoid denial of legitimate PC board warranty claims.

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Observe Safety Guidelines
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TROUBLESHOOTING GUIDE

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
Major physical or electrical damage is evident.	1. Contact your local Lincoln Authorized Field Service Facility.	1. Contact The Lincoln Electric Service Dept. (216) 383-2531 or 1-800-833-9353 (WELD).
No weld output and no auxiliary power. Engine operates normally.	1. Check brushes for wear. See the ***Maintenance*** section of this manual. 2. Check for loose or faulty connections at brush holders.	1. Perform the ***Rotor Voltage Test***. 2. If the rotor voltage is low or missing, check for the proper flashing current. Perform the ***Rotor Flashing Circuit Test***. 3. Perform the ***Rotor Resistance Test***. 4. The field capacitor (C1) or rectifier bridge (D1) may be faulty. Test or replace. 5. Test the rheostat (R1). Normal resistance is 3.3 ohms.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
No weld output, the auxiliary power (230-115VAC) operates normally. Engine runs normally.	1. Check the open circuit voltage (OCV) at the welder output terminals. Normal is 75 to 82VDC with engine at high idle (3750 RPM) and the output rheostat at maximum. If the correct OCV is present, go to Step 3, below. 2. If the open circuit voltage is NOT present at the welder output terminals, contact your local Lincoln Electric Authorized Field Service Facility. 3. Check the welding cables, clamps and electrode holder for loose or broken connections.	1. Check the continuity (low resistance) from the positive output terminal, through the choke (L1), to the positive side of the output rectifier bridge (D2). See Wiring Diagram. 2. Check the continuity (zero ohms) from the negative output terminal to the negative side of the output rectifier bridge (D2). See Wiring Diagram. 3. Perform the ***Output Rectifier Bridge Tes***t. 4. Perform the ***Main Stator Winding Test.***

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
No auxiliary power – welding output is normal – engine runs normally.	1. Make sure that the control rheostat (R1) is set at maximum. 2. Check for a loose or faulty plug at the power receptacle. 3. If the machine is equipped with circuit breakers, check and reset if tripped.	1. Check the auxiliary power receptacles and associated wires for loose or faulty connections. 2. Check the continuity (zero ohms) of leads #3, #5, and #6 from the receptacles to the main stator windings. See Wiring Diagram. 3. Make sure lead #5 is grounded to the machine frame (zero ohms). 4. Perform the ***Main Stator Winding Test.***

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
Low weld output and low auxiliary output.	1. The generator brushes may be worn. See the ***Maintenance*** section of this manual or contact your local Lincoln Electric Authorized Field Service Facility. 2. The engine RPM may be low.	1. Perform the ***Rotor Voltage Test.*** 2. If the rotor voltage is low, the field capacitor (C1) or the field rectifier bridge (D1) may be faulty. Test or replace. 3. Check the rheostat (R1). Normal resistance is 3.3 ohms. See Wiring Diagram. 4. The rotor may be faulty. Perform the ***Rotor Resistance Test.*** 5. The engine RPM may be low. Perform the ***Engine Throttle Adjustment Test.*** 6. If the engine idle RPM is okay, the engine may have lost horsepower and be in need of major repair.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ENGINE PROBLEMS		
Engine will not start.	1. Make sure the RUN/STOP Switch is in the “RUN” position. 2. Make sure the fuel shut off valve is in the open position. 3. Make sure the engine has adequate fuel and oil. 4. Adjust the choke to prevent carburetor flooding. 5. Check the spark plug wire for loose or faulty connections.	1. Check the fuel line for breaks or obstructions. 2. The spark plug may be faulty. Replace. 3. Service the engine as outlined in the ***Maintenance*** section of this manual. 4. The engine ignition module may be faulty. Consult Briggs & Stratton Service.
Engine runs erratic or stops running.	1. The oil level may be low, activating the engine oil level shutdown system. Check oil level. 2. Check the spark plug wire for loose or faulty connection. 3. The spark plug may be faulty. Replace. 4. The fuel and air mixture may be out of adjustment. Consult the Briggs & Stratton Owner’s Manual. 5. The fuel supply may be contaminated with water.	1. If the oil level is correct, the oil level shutdown switch may be faulty. Remove the lead running from the oil level switch to the ignition module. If the engine runs normally, the oil level switch is faulty. Replace. DO NOT OPERATE THE ENGINE WITHOUT OIL LEVEL PROTECTION. 2. The engine may require service to the head or carburetor.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ENGINE PROBLEMS		
Engine will NOT idle down to low speed.	1. Make sure the idler control switch is in the “AUTO” idle position. 2. Remove any external load on the welder terminals or auxiliary power receptacles.	1. With the idler control switch in the “AUTO” position and all external loads removed, check for 12VDC at leads #208 and #209. See Wiring Diagram. If the 12VDC is present and the idler solenoid does not activate, the solenoid may be faulty. Replace. 2. If the 12VDC is NOT present at leads #208 and #209, perform the ***Main Stator Winding Test***. 3. Check leads #15A (at stator) to #16 (at idler P.C. board) for continuity (zero ohms). Check leads #9A (at stator) to #9B (at idler P.C. board) for continuity (zero ohms). See Wiring Diagram. 4. The idler P.C. board may be faulty. Replace.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ENGINE PROBLEMS		
Engine idles down to low idle but will not stay at low idle.	1. Remove any external load on the welder terminals or auxiliary power receptacles. 2. The engine low idle RPM may be set too low. Contact your local Lincoln Electric Field Service Facility.	1. The engine low idle RPM may be set too low. Perform the ***Engine Throttle Adjustment Test.*** 2. With the idler control switch in the "AUTO" position and all external loads removed, check for 12VDC at leads #208 and #209. See Wiring Diagram. If the 12VDC is present and the solenoid does not stay activated, the solenoid may be faulty. Replace.
Engine will not go to high idle when attempting to weld or when the auxiliary power is loaded. Welding output and auxiliary power output is normal when idler control switch is in the "HIGH" position.	1. Check work and electrode cables for loose or faulty connections. 2. The mechanical linkage between the solenoid and engine may be stuck.	1. Locate plug J2 on the control board. With a load on the machine, measure the AC voltage across the two leads in plug J2. Normal is 1.0 VAC minimum. If the correct voltage is present, the idler P.C. board may be faulty. Replace. 2. If the correct voltage is NOT present at Plug J2 leads, check the continuity of the leads from the current transformer to plug J2. See Wiring Diagram. 3. The current transformer may be faulty. Replace.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ENGINE PROBLEMS		
Engine will not go to high idle when attempting to weld. Welding output is normal when the idler control switch is in the “HIGH” position. Automatic idle function works properly when the auxiliary power is loaded.	1. Make sure the welding cables and connections are tight.	1. Make sure the #W1 lead is looped through the current transformer. See Wiring Diagram. 2. Check for loose or faulty connections on the heavy current carrying leads connected to the output terminals, the choke (L1) and the output rectifier bridge (D2).
Engine will not go to high idle when using the auxiliary power. Auxiliary power output is normal when the idler control switch is in the “HIGH” position. Automatic idle function works properly when the welding output is loaded.	1. Make sure that the auxiliary load is more than 100 watts. 2. Check for loose or faulty connections at the auxiliary output receptacles.	1. Make sure that leads #3A and #6A are looped through the current transformer in the proper direction. See Wiring Diagram.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ENGINE PROBLEMS		
The welding arc is "cold." The engine runs normally. The auxiliary power functions normally.	1. Check for loose or faulty connections at the weld output terminals and welding cable connections. 2. The welding cable may be too long or coiled, causing an excessive voltage drop.	1. With the output control at maximum, check for the correct open circuit voltage (OCV) at the welder output terminals (75 - 82 VDC). If the correct open circuit voltage is present at the output terminals, check for loose connections on the heavy current carrying leads inside the WELDANPOWER 125. See Wiring Diagram. 2. If the OCV is low at the welder output terminals, perform the ***Engine Throttle Adjustment Test.*** 3. Perform the ***Output Rectifier Bridge Test.*** 4. Check for shorted or grounded windings in the choke (L1).

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353.

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ROTOR VOLTAGE TEST

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

TEST DESCRIPTION

This test will determine if the correct DC voltage is being applied to the rotor at maximum engine speed (3700 RPM). This information will aid the technician in determining if the generator field is operating properly.

MATERIALS NEEDED

Volt/Ohmmeter
5/16” Nut driver
Wiring Diagram

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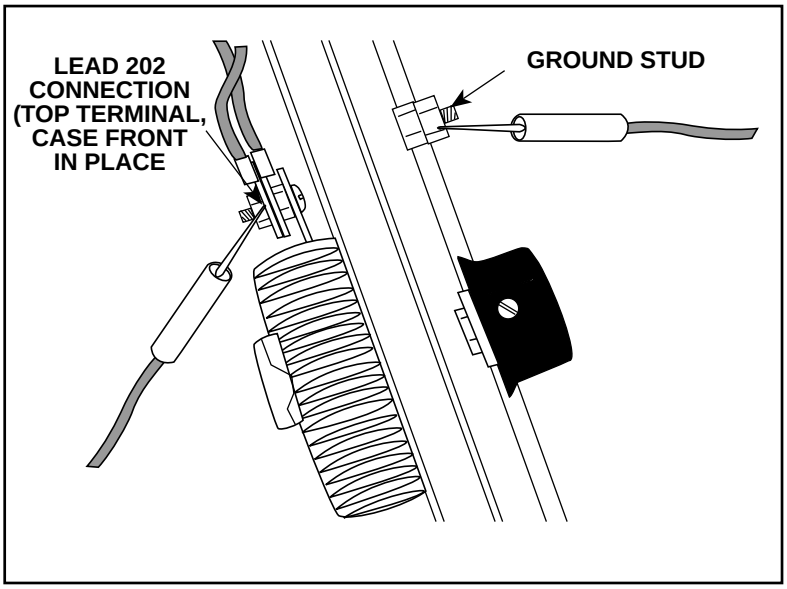
ROTOR VOLTAGE TEST *(continued)*

FIGURE F.1 - LOCATION OF LEAD 202 FOR ROTOR VOLTAGE TEST



TEST PROCEDURE

1. With the 5/16” nut driver, remove the 8 sheet metal screws that hold the top cover to the control box. Remove the top cover.
2. Start the machine and run it at high idle. Set the output control (rheostat) at the MAXIMUM setting.
3. Set the volt/ohmmeter at the DC position.
4. Place the positive probe on lead #202 (two red wires joined together) where it connects at the back of the rheostat. See Figure F.1 for location. Place the negative probe on the machine ground stud or any other good, unpainted ground.
5. Check the voltage reading on the volt/ohmmeter. It should read 40 - 47 VDC.
6. If the voltage is low or not present, the generator field circuit is not functioning correctly. Proceed with the Rotor Resistance Test. C1, R1, or D1 may also be faulty.
7. If rotor voltage is correct, the generator field is okay. Replace the top cover on the control box. Tighten the 8 sheet metal screws with the 5/16” nut driver.

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ROTOR RESISTANCE TEST

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

TEST DESCRIPTION

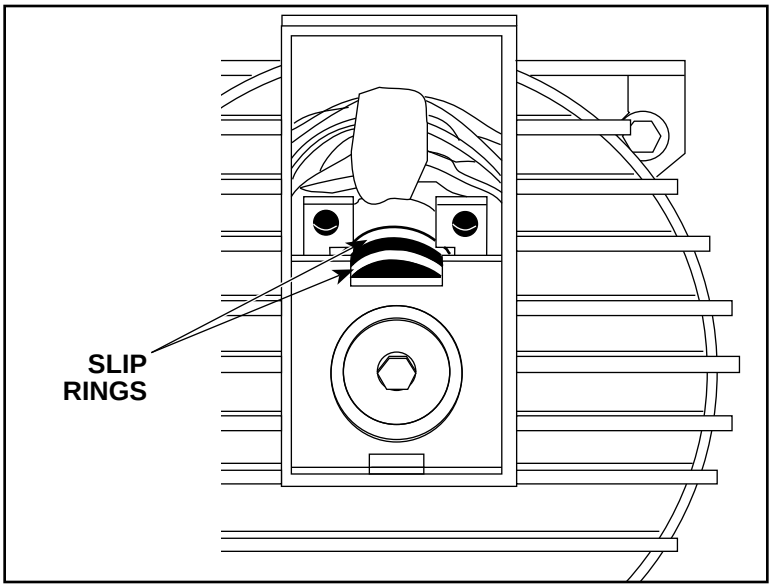
This test will determine if there is a shorted winding in the rotor or if the rotor is grounded.

MATERIALS NEEDED

Volt/Ohmmeter
1/4” Nut driver
Small slot head screw driver
Wiring Diagram

ROTOR RESISTANCE TEST *(continued)*

FIGURE F.2 – LOCATION OF ROTOR SLIP RINGS - BRUSH HOLDER ASSEMBLY REMOVED



TEST PROCEDURE

1. Conduct the test with the gasoline engine OFF.
2. Remove the spark plug wire to prevent accidental engine kickback or starting.
3. Isolate the rotor electrically by removing the generator brushes. Refer to Figure F.2 as you perform the remaining steps.
4. Open the brush holder assembly cover. Squeeze the 2 tabs and depress the cover at the top with a screw driver or your fingernail. The cover will drop open on its bottom hinge.
5. With the 1/4" nut driver, remove the 2 screws that hold the brush holder assembly in place.
6. Slide the brush holder assembly out and lay it aside, held by the 2 wires attached.
7. Measure the resistance across the rotor slip rings.
   A. Set the ohmmeter on the low scale (X1).
   B. Place one meter probe on one of the rotor slip rings. Place the other probe on the other slip ring.
   C. Check the resistance across the slip rings. It should read 7 - 8 ohms.
8. Measure the resistance to ground.
   A.. Set the ohmmeter on the high scale (X100,000).
   B. Place one probe on either of the slip rings. Place the other probe on any good, unpainted ground. Use the ground stud or the rotor thru-bolt.
   C. Check the resistance. It should read very high, at least .5 megohm (500,000 ohms).

If the resistance checks meet the specifications, then the rotor is okay.

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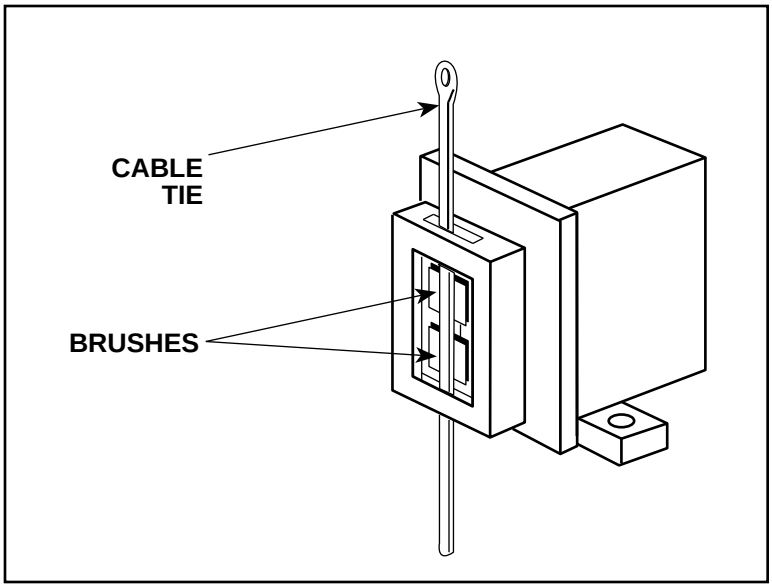
ROTOR RESISTANCE TEST *(continued)*

FIGURE F.3 – BRUSHES RETAINED WITH CABLE TIE



9. Reinstall the brush holder assembly after the test. Depress the spring-loaded brushes into the holder and slip a suitable non-metallic, fairly stiff retainer through the slots at the top and bottom of the holder. A cable tie works well; see Figure F.3. This will hold the brushes up so that you can easily install the holder.
10. Slip the holder into position in the generator end bracket. Be careful not to loosen the 2 attached wires.
11. Reinstall and tighten the 2 screws with the 1/4" nut driver.
12. Slowly remove the non-metallic retainer from the brush holder and let the brushes snap back against the slip rings.
13. Snap the brush holder cover back into position.

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OUTPUT RECTIFIER BRIDGE TEST

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

TEST DESCRIPTION

This test will determine if there are faulty diodes in the output rectifier bridge.

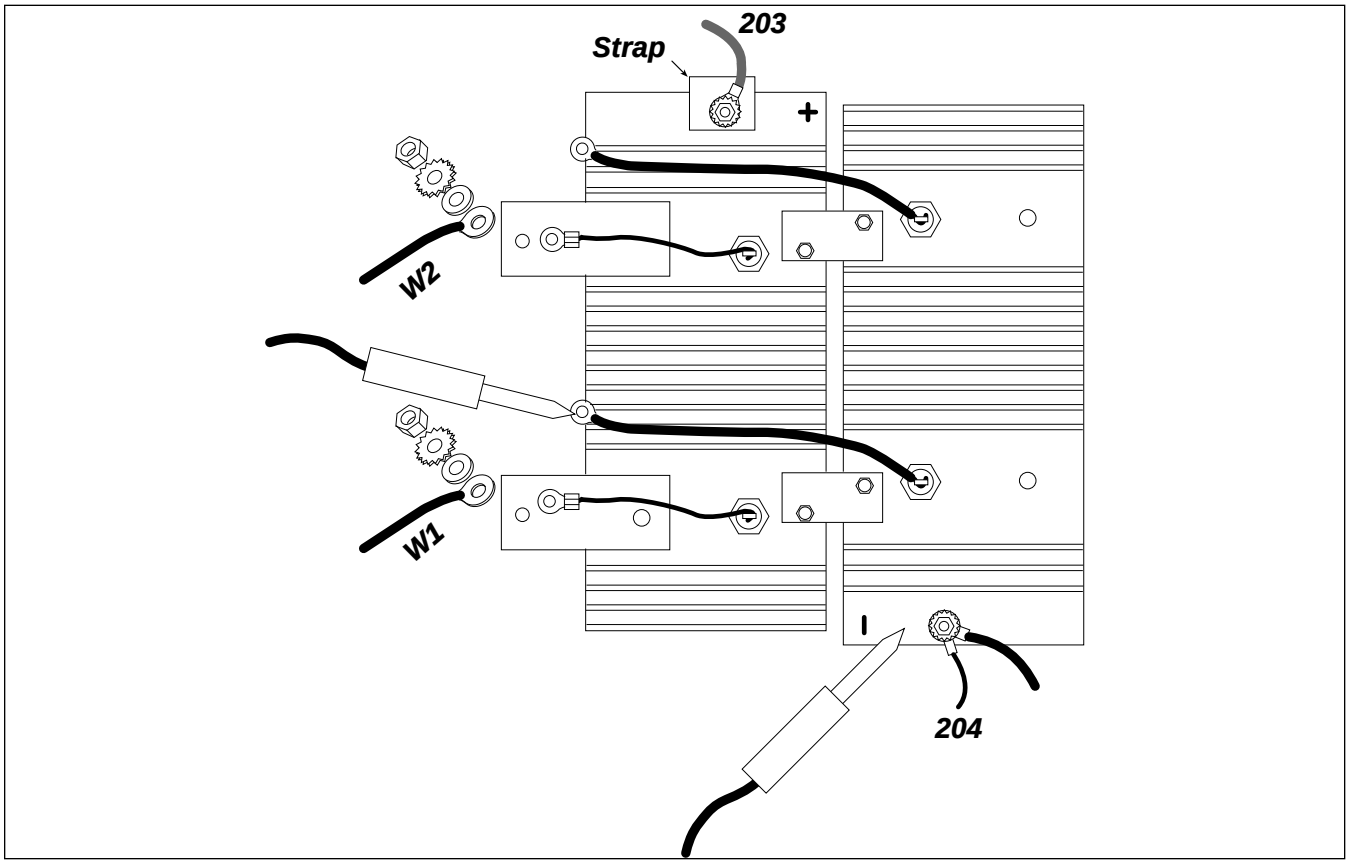
MATERIALS NEEDED

Volt/Ohmmeter (Diode Tester)
7/16" Wrench
5/16" Nut driver
Wiring Diagram

TROUBLESHOOTING & REPAIR

OUTPUT RECTIFIER BRIDGE TEST *(continued)*

FIGURE F.4 - OUTPUT RECTIFIER BRIDGE



TEST PROCEDURE

1. Conduct this test with the gasoline engine OFF.
2. Remove the spark plug wire to prevent accidental engine kickback or starting.
3. With the 5/16" nut driver, remove the 8 sheet metal screws that hold the top cover to the control box. Remove the top cover.
4. Locate the output rectifier bridge.
5. With the 7/16" wrench, remove the nuts and washers that hold the four diode pigtail leads and the heavy current carrying leads to the studs located at the front of the rectifier bridge assembly. Note lead placement for reassembly. See Figure F.4.
6. Electrically isolate the diode pigtails.
7. With the volt/ohmmeter or diode tester, check the resistance of each of the four diodes from their pigtail leads to their respective heat sinks. Alternate placement of the test probes. Resistance should be high in one direction and low in the other.
8. Replace any shorted or open diodes.
9. Reassemble the heavy current carrying leads and pigtails to their respective studs. The proper fastener sequence is: pigtail - lead - flat washer - lock washer - nut.
10. Replace the top cover on the control box. Tighten the 8 sheet metal screws with the 5/16" nut driver.

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MAIN STATOR TEST

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

TEST DESCRIPTION

This test will determine if the main stator is generating the proper AC output voltages.

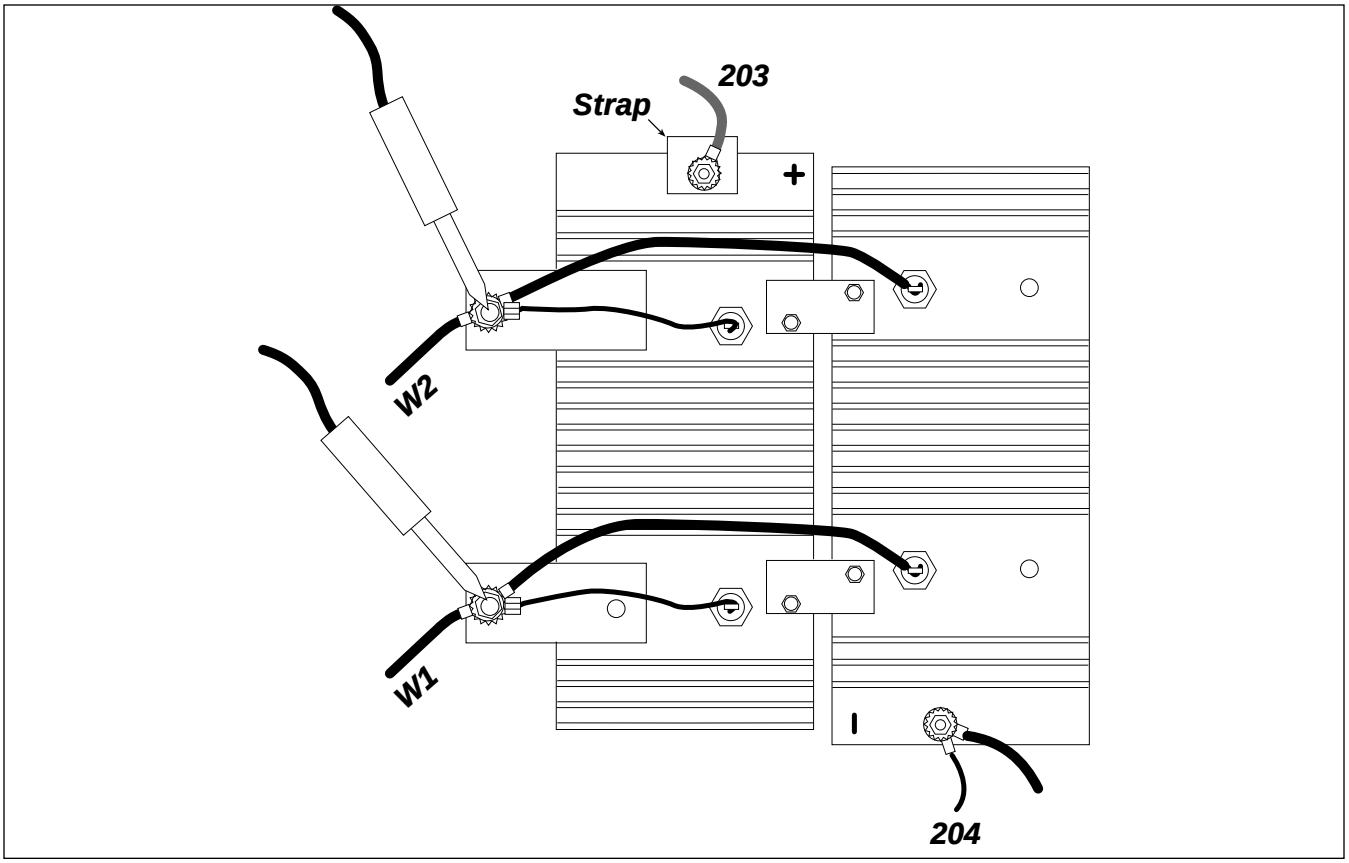
MATERIALS NEEDED

Volt/Ohmmeter
5/16" Nut driver
5/16" Open end or box wrench
Wiring Diagram

TROUBLESHOOTING & REPAIR

MAIN STATOR TEST *(continued)*

FIGURE F.5 - LOCATION OF LEADS W1 AND W2



TEST PROCEDURE

1. With the 5/16" nut driver, remove the 8 sheet metal screws that hold the top cover to the control box. Remove the top cover.
2. With the 5/16" nut driver and the 5/16" open end or box wrench, remove the 6 sheet metal screws that hold the control panel in place. Move the panel aside to provide access to the test points. Be sure to secure the panel while the engine in running during the test.

⚠ WARNING

MOVING PARTS can injure.

Keep away from moving parts.

⚠ WARNING

ENGINE EXHAUST can kill.

Use in open, well ventilated areas or vent exhaust to the outside.

3. Start the engine and run it at High Idle (3700 - 3800 RPM). Set the Output Control (R1) at maximum. Remove all external loads from the machine.
3. Locate leads W1 and W2 at the output rectifier bridge studs. See Figure F.5.
4. Check for 80 VAC at leads W1 to W2.

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TROUBLESHOOTING & REPAIR

MAIN STATOR TEST *(continued)*

FIGURE F.6 - MAIN STATOR MOLEX PLUG TEST POINTS

FIGURE F.6
MAIN STATOR MOLEX PLUG TEST POINTS

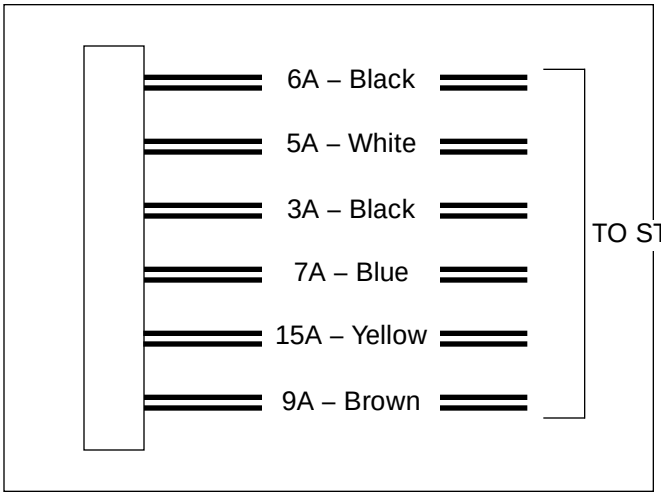
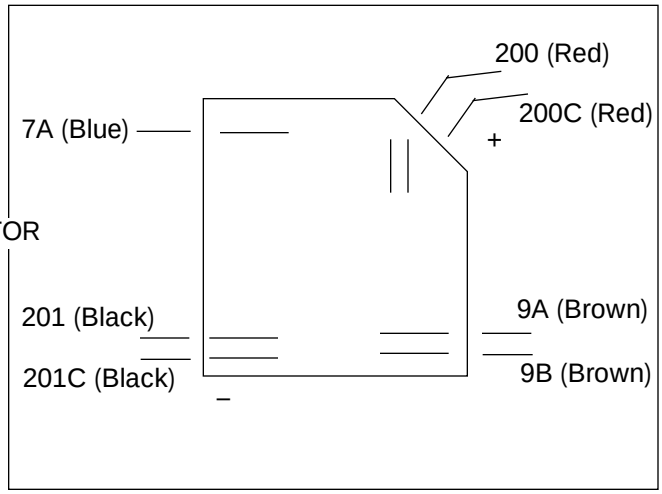


FIGURE F.7
DIODE BRIDGE LEAD ASSIGNMENTS



5. Locate the 6 pin molex type connector from the main stator.
6. Check for 240 - 260 VAC at leads #6A to #3A. See Figure F.6. You may want to shut off the engine, insert the test probes into the molex plug, then restart the engine. Cut any necessary cable ties to perform the test.

NOTE: Insert the probes on the STATOR side of the plug. This will eliminate the possibility of problems in the plug itself.

7. Check for 120 - 130 VAC at leads #5A to #3A. See Figure F.6.
8. At the field rectifier diode bridge, check for 37.5 VAC at leads #9A (Brown) to #7A (Blue). See Figure F.7 and the Wiring Diagram. You may check these leads at the molex plug; however, it's best to check them at the rectifier bridge.
9. Check for 21.5 VAC at leads #9A (Brown) to #15A (Yellow). See Figure F.6.
10. If any ONE of the voltage readings are incorrect, the main stator may be faulty.
11. If ALL the voltage readings are incorrect, the problem may be the engine RPM or rotor field problems.
12. After the problem has been repaired, replace any cable ties that were cut for the test.
13. Install the control panel with the 6 sheet metal screws. Use the 5/16" nut driver and 5/16" wrench.
14. Replace the top cover on the control box. Tighten the 8 sheet metal screws with the 5/16" nut driver.

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Return to Master TOC
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ROTOR "FLASHING" CIRCUIT TEST

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

TEST DESCRIPTION

This test will determine if the engine magneto is supplying the proper "flashing" current to the rotor.

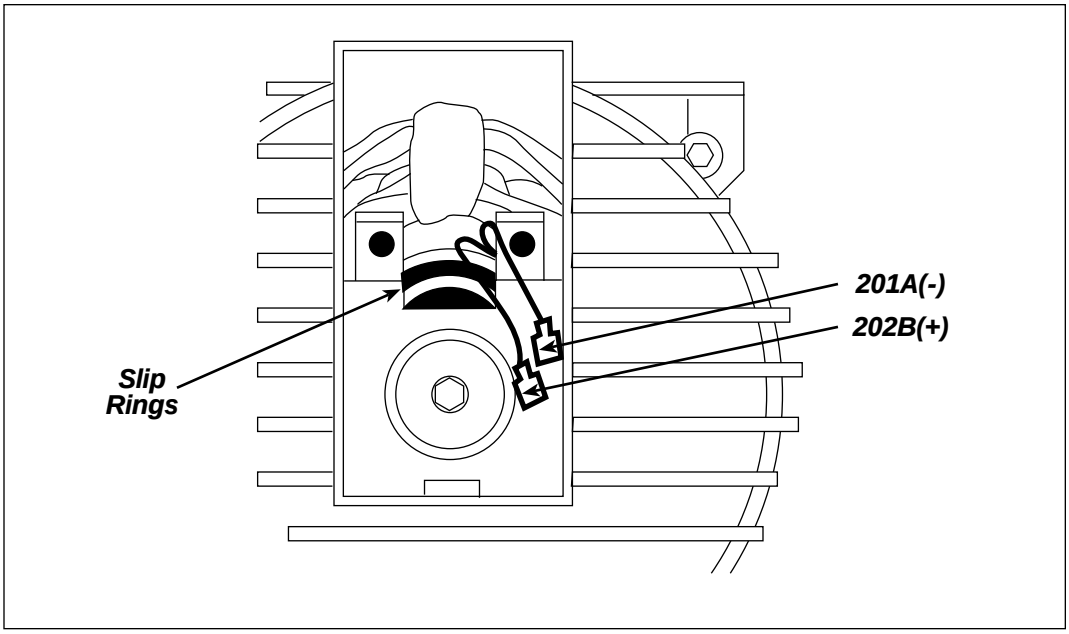
MATERIALS NEEDED

Volt/Ohmmeter
5/16" Nut driver
DC Ammeter
Wiring Diagram

TROUBLESHOOTING & REPAIR

ROTOR "FLASHING" CIRCUIT TEST *(continued)*

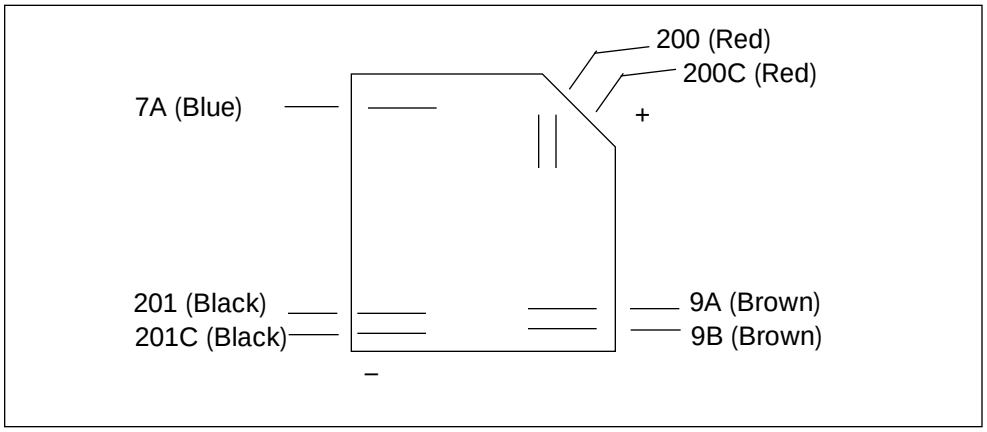
FIGURE F.8 - BRUSH HOLDER LEADS 201A(-) AND 202B (+)



TEST PROCEDURE

1. With the 5/16" nut driver, remove the 8 sheet metal screws that hold the top cover to the control box. Remove the top cover.
2. Locate and remove lead #201A from the brush holder. See Figure F.8 for location.
3. Connect the negative (-) lead of the DC ammeter to lead #201A and the positive (+) lead to the brush holder.
4. Remove lead #7A from field diode bridge rectifier D1. See Figure F.9. Electrically isolate the lead.

FIGURE F.9 - DIODE BRIDGE LEAD ASSIGNMENTS



Return to Section TOC
Return to Master TOC

TROUBLESHOOTING & REPAIR

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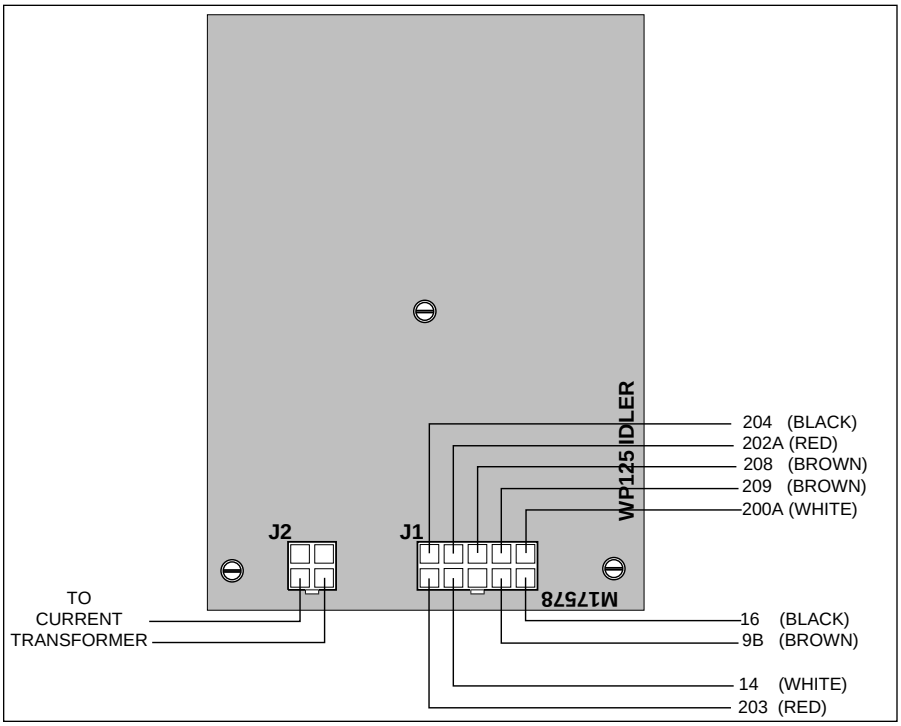
ROTOR "FLASHING" CIRCUIT TEST *(continued)*

FIGURE F.10 - IDLER P.C. BOARD PIN ASSIGNMENTS



⚠ WARNING

MOVING PARTS can injure.

Keep away from moving parts.

ENGINE EXHAUST can kill.

Use in open, well ventilated areas or vent exhaust to the outside.

5. Start the engine and run it at High Idle (3700 - 3800 RPM).
6. The DC ammeter should read between 0.22 and 0.30 amps.
7. If the DC ammeter reads 0.0 amps, check for flashing voltage between lead #202B from the brush holder and case ground (lead #201). See Figure F.8 and the Wiring Diagram. Normal flashing voltage is 2.05 VDC.
8. If normal flashing voltage is present, perform the Rotor Resistance Test. Also be sure that all #201 leads have continuity (zero ohms) to case ground.
9. If normal flashing voltage is NOT present from lead #202 to case ground, check the continuity of lead #202 to the idler P.C. board. Also check the continuity of lead #14 from the engine magneto to the P.C. board. See Figure F.10 and the Wiring Diagram.
10. If the above continuity checks are good, run the engine at high idle (3700 - 3800 RPM). Check for an AC voltage from lead #14 to case ground. Normal is 3.30 VAC. If a low or zero AC voltage is indicated, the engine magneto may be faulty. Replace.
11. If the AC voltage reading from step 9 is normal, the idler P.C. board may be faulty. Replace the idler P.C. board.
12. After the problem has been repaired, replace the top cover on the control box. Tighten the 8 sheet metal screws with the 5/16" nut driver.

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Return to Master TOC

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ENGINE THROTTLE ADJUSTMENT TEST

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

TEST DESCRIPTION

If the machine output is low, this test will determine whether the gasoline engine high idle speed is set for the correct maximum RPM. It will also let you adjust the low idle speed.

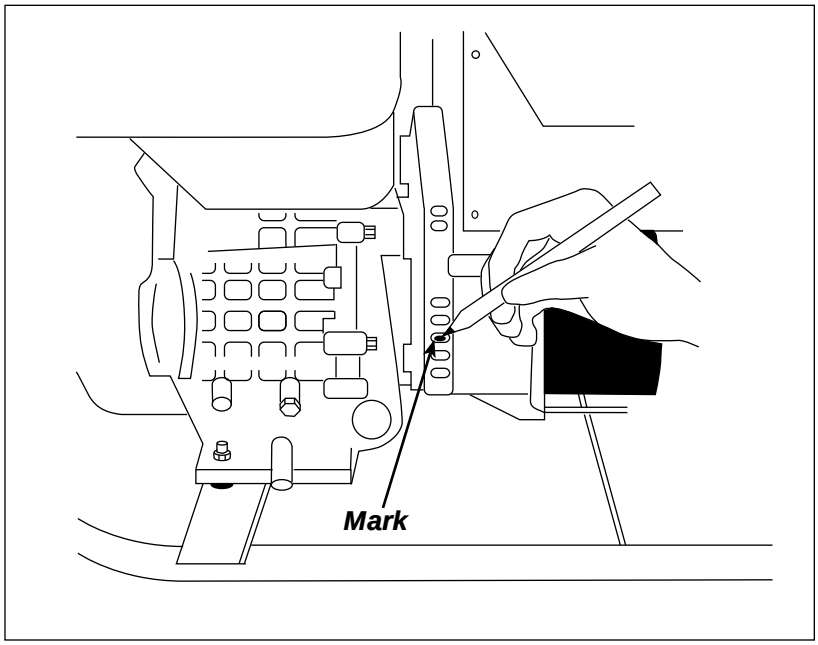
MATERIALS NEEDED

7/16" Open end or box wrench
Slot head screw driver
Dowel rod (approximately 12") or long-blade screw driver
Frequency counter or strobe-tach
Black or red marking pencil

TROUBLESHOOTING & REPAIR

ENGINE THROTTLE ADJUSTMENT TEST *(continued)*

FIGURE F.11 - BLOWER PADDLE MARKED FOR STROBE-TACH METHOD



TEST PROCEDURE

This test can be conducted by any of three methods.

Strobe-tach Method:

1. Remove the spark plug wire to prevent accidental kickback or starting.
2. With the black or red marking pencil, place a mark on one of the blower paddles, which can be reached through the vent slots in the end bracket. See Figure F.11.
3. Connect the strobe-tach according the manufacturer's instructions.

⚠ WARNING

MOVING PARTS can injure.

Keep away from moving parts.

⚠ WARNING

ENGINE EXHAUST can kill.

Use in open, well ventilated areas or vent exhaust to the outside.

4. Reconnect the spark plug wire and start the engine. Direct the strobe-tach light on the blower paddle and synchronize it to the rotating mark.

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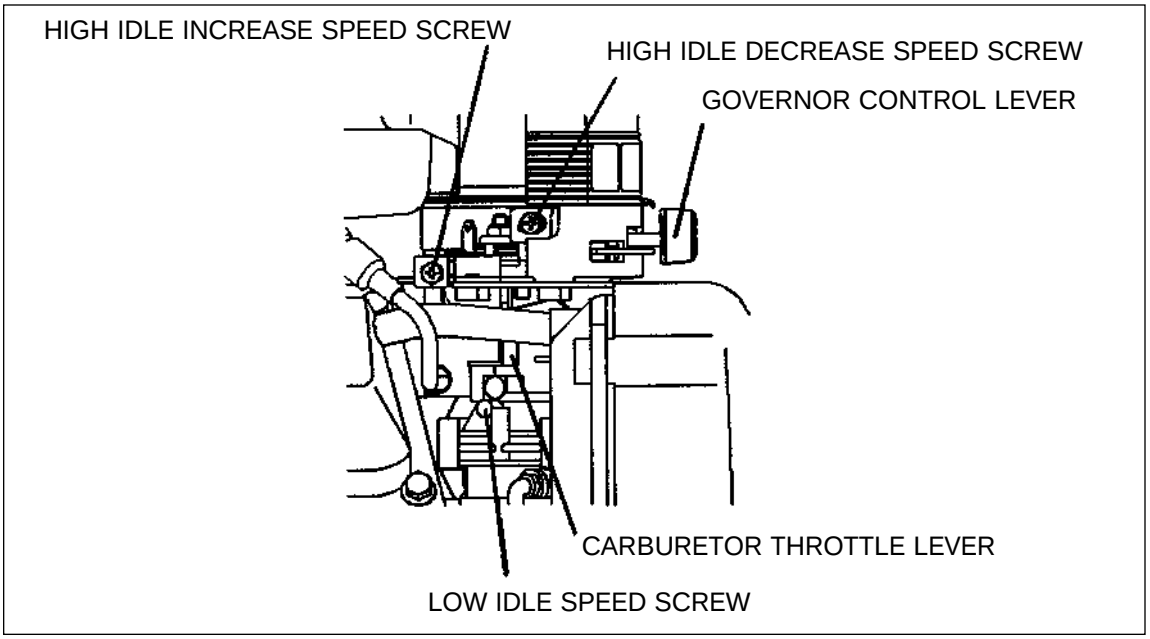
Return to Section TOC
Return to Master TOC

TROUBLESHOOTING & REPAIR

ENGINE THROTTLE ADJUSTMENT TEST *(continued)*

FIGURE F.12 - IDLE SPEED ADJUSTMENT SCREW LOCATIONS


HIGH IDLE INCREASE SPEED SCREW
HIGH IDLE DECREASE SPEED SCREW
GOVERNOR CONTROL LEVER
CARBURETOR THROTTLE LEVER
LOW IDLE SPEED SCREW

5. ADJUST HIGH IDLE: With the Idler Switch set on HIGH, the tach should read between 3700 and 3800 RPM.

   a. If the engine speed is above 3800 RPM, turn the High Idle Increase Speed screw counter-clockwise several turns. Turn the High Idle Decrease Speed screw clockwise until the engine speed is between 3700 and 3800 RPM. See Figure F.12.

      Next, turn the High Idle Increase Speed screw clockwise until the screw contacts the tab on the Governor Control Lever. Do NOT tighten the screw any further, as this may cause the tab to bend. See Figure F.12.

   b. If the engine speed is below 3700 RPM, turn the High Idle Decrease Speed screw counter-clockwise several turns. Turn the High Idle Increase Speed screw clockwise until the engine speed is between 3700 and 3800 RPM. See Figure F.12.

      Next, turn the High Idle Decrease Speed screw clockwise until the screw contacts the tab on the Governor Control Lever. Do NOT tighten the screw any further, as this may cause the tab to bend. See Figure F.12.

   c. After the adjustments are made, try to move the Governor Control Lever. There should be no movement. The two high idle speed screws are designed to work against opposite sides of the Governor Control Lever tab so that no movement (and therefore no increase in speed) is possible.

6. ADJUST LOW IDLE: Using a piece of dowel rod or a long screw driver, push the governor arm back until the Carburetor Throttle Lever rests against the Low Idle Speed screw. See Figure F.12. You can also push the arm back with your hand, but this is not recommended because you could be burned by the hot muffler. Adjust the Low Idle Speed screw until the engine speed is 2075 + 75 RPM.

   Set the Idler Switch on AUTO. The engine should go to low idle in about 12 seconds.

   Use the 3/8" wrench to turn the adjustment nut on the idler solenoid plunger, which changes the amount of throw in the governor arm. See Figure F.13. for location of the adjustment nut. Adjust the nut until the tach reads between 2250 and 2500 RPM.

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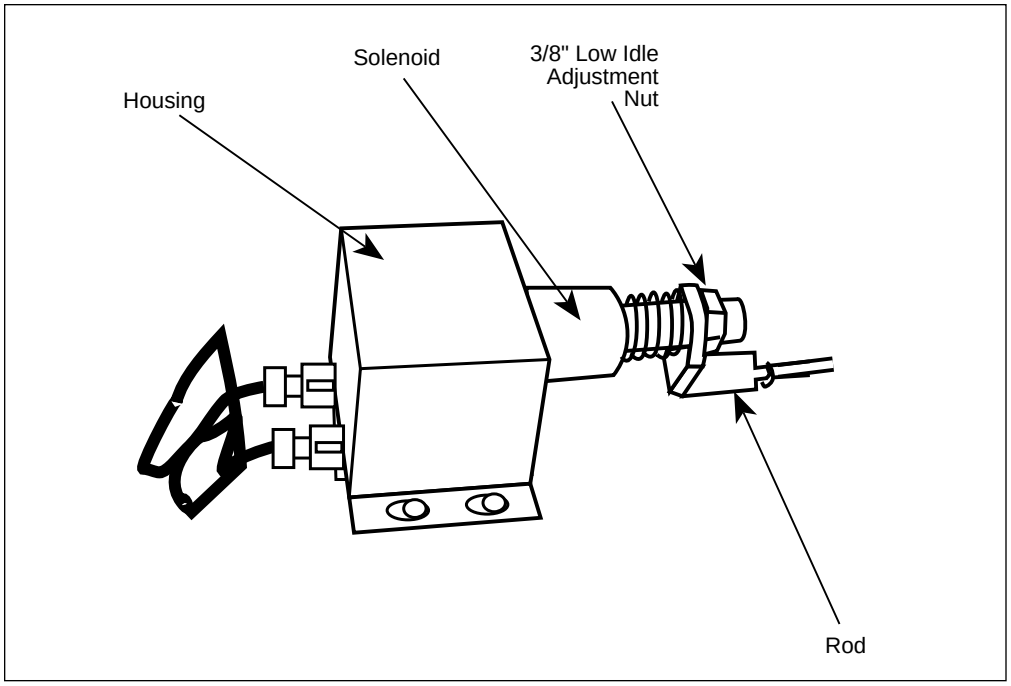
TROUBLESHOOTING & REPAIR

ENGINE THROTTLE ADJUSTMENT TEST *(continued)*

FIGURE F.13 - LOW IDLE ADJUSTMENT NUT ON IDLER SOLENOID



7. After you set the low idle speed, set the Idler Switch to HIGH and recheck the high idle speed. Adjust if necessary.

Frequency Counter Method:

1. Plug the frequency counter into one of the 115 VAC auxiliary receptacles.
2. Start the engine and check the frequency counter. With the Idler Switch set on HIGH, the counter should read 60.8 to 62.5 Hz. With the Idler Switch set on AUTO (and after the machine has changed speeds, about 12 seconds) the counter should read 35.8 to 37.5 Hz. If either of these readings is wrong, adjust as follows:
3. ADJUST HIGH IDLE:

   a. If the counter reading is above 62.5 Hz, turn the High Idle Increase Speed screw counter-clockwise several turns. Turn the High Idle Decrease Speed screw clockwise until the counter reading is between 60.8 and 62.5 Hz. See Figure F.12.

   Next, turn the High Idle Increase Speed screw clockwise until the screw contacts the tab on the Governor Control Lever. Do NOT tighten the screw any further, as this may cause the tab to bend. See Figure F.12.

   b. If the counter reading is below 60.8 Hz, turn the High Idle Decrease Speed screw counter-clockwise several turns. Turn the High Idle Increase Speed screw clockwise until the engine speed is between 60.8 and 62.5 Hz. See Figure F.12.

   Next, turn the High Idle Decrease Speed screw clockwise until the screw contacts the tab on the Governor Control Lever. Do NOT tighten the screw any further, as this may cause the tab to bend. See Figure F.12.

   c. After the adjustments are made, try to move the Governor Control Lever. There should be no movement. The two high idle speed screws are designed to work against opposite sides of the Governor Control Lever tab so that no movement (and therefore no increase in speed) is possible.

Return to Section TOC
Return to Master TOC

ENGINE THROTTLE ADJUSTMENT TEST *(continued)*

4. ADJUST LOW IDLE: Using a piece of dowel rod or a long screw driver, push the governor arm back until the Carburetor Throttle Lever rests against the Low Idle Speed screw. See Figure F.12. You can also push the arm back with your hand, but this is not recommended because you could be burned by the hot muffler. Adjust the Low Idle Speed screw until the frequency counter reading is 34.1 Hz.

   Set the Idler Switch set on AUTO. The engine should go to low idle in about 12 seconds.

   Use the 3/8" wrench to turn the adjustment nut on the idler solenoid plunger, which changes the amount of throw in the governor arm. See Figure F.13 for location of the adjustment nut. Adjust the nut until the frequency counter reads between 35.8 and 37.7 Hz.

5. After you set the low idle speed, set the Idler Switch to HIGH and recheck the high idle speed. Adjust if necessary.

Oscilloscope Method:

1. Connect the oscilloscope according to the manufacturer's instructions. At 3700 RPM, the waveform should exhibit a period of 16.2 milliseconds. Refer to the NORMAL OPEN CIRCUIT VOLTAGE WAVEFORM (115 VAC SUPPLY) HIGH IDLE - NO LOAD in this section of the manual. At 2200 RPM, the waveform should exhibit a period of 27.3 milliseconds.

2. Start the engine and check the oscilloscope. With the Idler Switch set on HIGH, the waveform should exhibit a period of 16.2 milliseconds. With the Idler Switch set on AUTO (and after the machine has changed speeds, about 12 seconds) the waveform should exhibit a period of 27.3 milliseconds. If either of these readings is wrong, adjust as follows:

3. ADJUST HIGH IDLE:

   a. If the waveform period is less than 16.2 milliseconds, turn the High Idle Increase Speed screw counter-clockwise several turns. Turn the High Idle Decrease Speed screw clockwise until the waveform period is 16.2 milliseconds. See Figure F.12.

      Next, turn the High Idle Increase Speed screw clockwise until the screw contacts the tab on the Governor Control Lever. Do NOT tighten the screw any further, as this may cause the tab to bend. See Figure F.12.

   b. If the waveform period is greater than 16.2 milliseconds, turn the High Idle Decrease Speed screw counter-clockwise several turns. Turn the High Idle Increase Speed screw clockwise until the waveform period is 16.2 milliseconds. See Figure F.12.

      Next, turn the High Idle Decrease Speed screw clockwise until the screw contacts the tab on the Governor Control Lever. Do NOT tighten the screw any further, as this may cause the tab to bend. See Figure F.12.

   c. After the adjustments are made, try to move the Governor Control Lever. There should be no movement. The two high idle speed screws are designed to work against opposite sides of the Governor Control Lever tab so that no movement–(and therefore no increase in speed–) is possible.

4. ADJUST LOW IDLE: Using a piece of dowel rod or a long screw driver, push the governor arm back until the Carburetor Throttle Lever rests against the Low Idle Speed screw. See Figure F.13. You can also push the arm back with your hand, but this is not recommended because you could be burned by the hot muffler. Adjust the Low Idle Speed screw until the waveform period is approximately 29 milliseconds.

   Set the Idler Switch on AUTO. The engine should go to low idle in about 12 seconds.

   Use the 3/8" wrench to turn the adjustment nut on the idler solenoid plunger, which changes the amount of throw in the governor arm. See Figure F.13. for location of the adjustment nut. Adjust the nut until the waveform period is 27.3 milliseconds.

5. After you set the low idle speed, set the Idler Switch to HIGH and recheck the high idle speed. Adjust if necessary.

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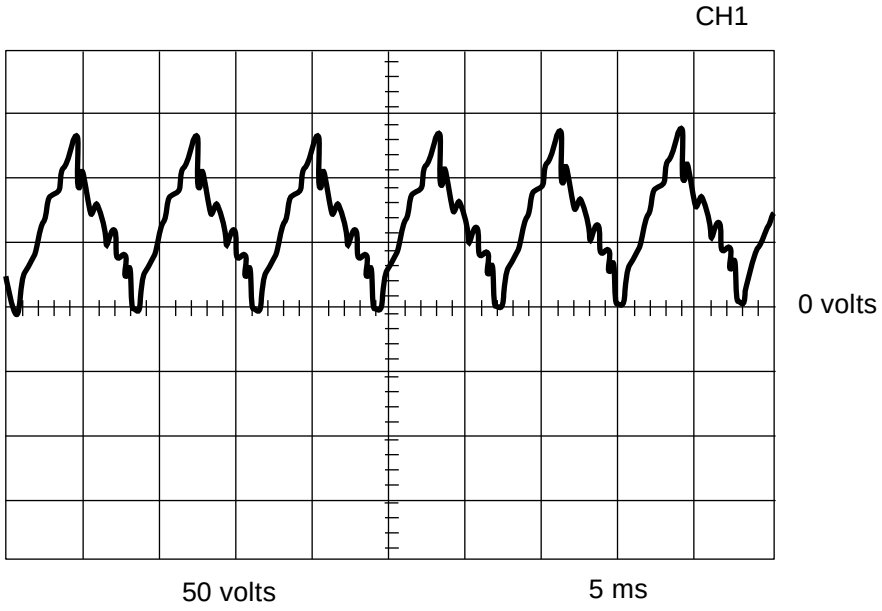
NORMAL OPEN CIRCUIT WELD VOLTAGE WAVEFORM

HIGH IDLE – NO LOAD – OUTPUT CONTROL AT MAXIMUM



This is the typical output voltage generated from a properly operating machine. Note that each vertical division represents 50 volts and that each horizontal division represents 5 milliseconds in time.

Note: Scope probes connected at machine output terminals.

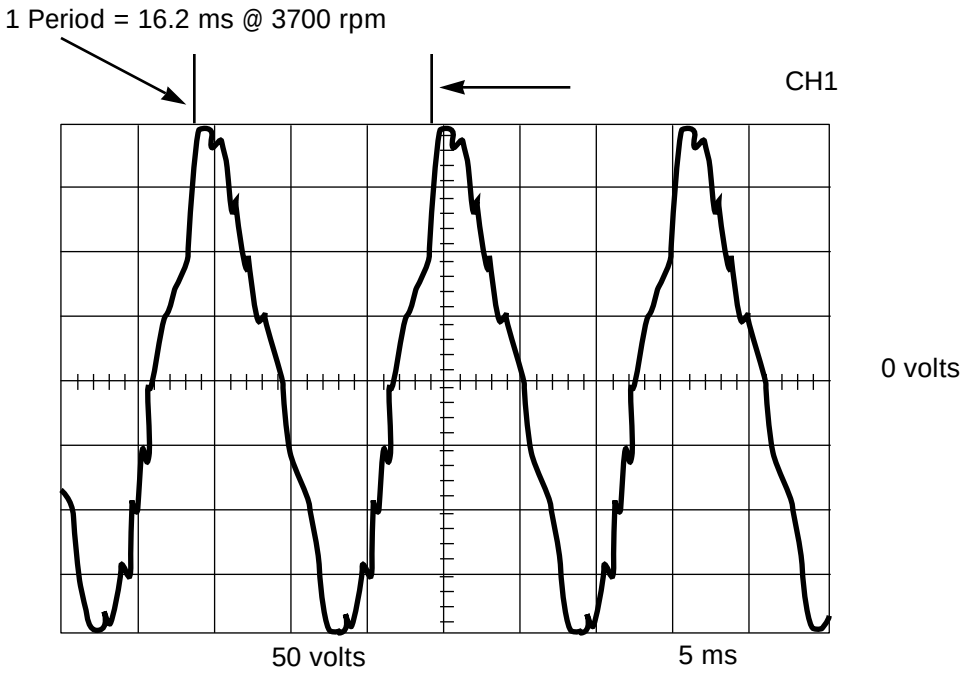
SCOPE SETTINGS

Volts/Div	50V/Div.
Horizontal Sweep	5 ms/Div.
Coupling	DC
Trigger	Internal

Return to Section TOC
Return to Master TOC

NORMAL OPEN CIRCUIT VOLTAGE WAVEFORM (115 VAC SUPPLY)

HIGH IDLE – NO LOAD – OUTPUT CONTROL AT MAXIMUM



This is the typical AC output voltage generated from a properly operating machine. Note that each vertical division represents 50 volts and that each horizontal division represents 5 milliseconds in time.

Note: Scope probes connected at machine 115 VAC receptacle.

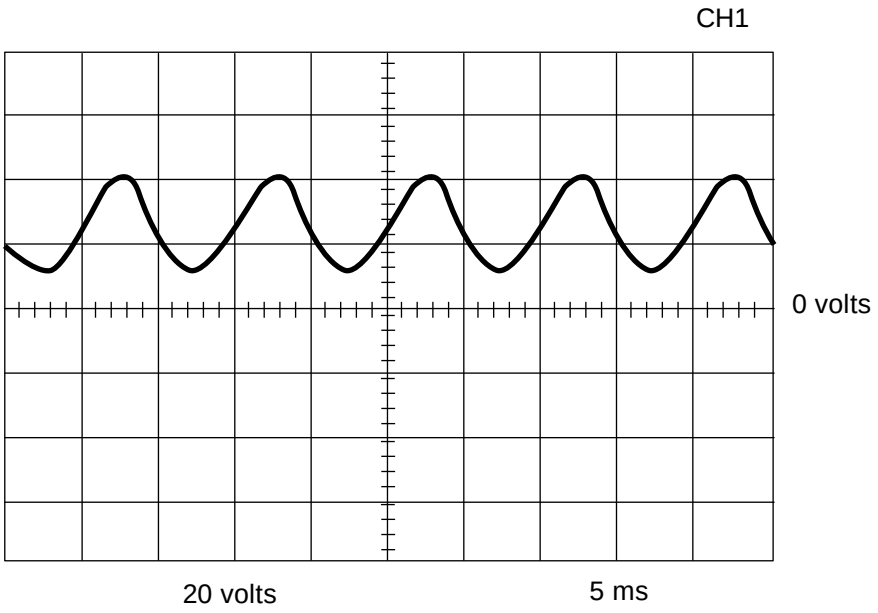
SCOPE SETTINGS

Volts/Div	50V/Div.
Horizontal Sweep	5 ms/Div.
Coupling	DC
Trigger	Internal

Return to Section TOC
Return to Master TOC

TYPICAL WELD OUTPUT WAVEFORM

MACHINE LOADED



MACHINE LOADED TO 125 AMPS AT 25 VAC

This is the typical DC output voltage generated from a properly operating machine. Note that each vertical division represents 20 volts and that each horizontal division represents 5 milliseconds in time. The mahine was loaded with a resistance grid bank.

Note: Scope probes connected at machine output terminals.

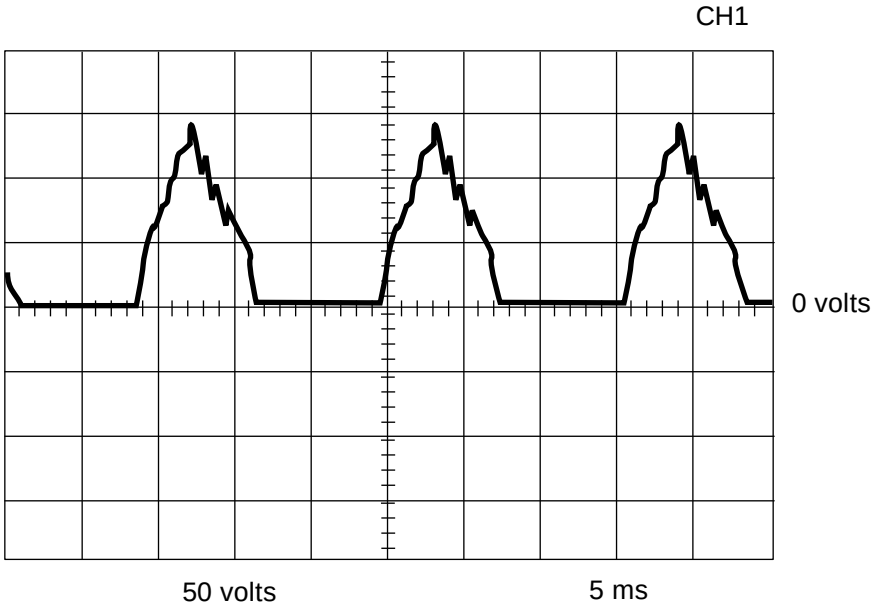
SCOPE SETTINGS

Volts/Div	20V/Div.
Horizontal Sweep	5 ms/Div.
Coupling	DC
Trigger	Internal

Return to Section TOC
Return to Master TOC

ABNORMAL OPEN CIRCUIT WELD VOLTAGE WAVEFORM

HIGH IDLE – NO LOAD – OUTPUT CONTROL AT MAXIMUM



This is not the typical DC output voltage waveform. Note the “gap” in the waveform. One output diode was disconnected to simulate an “open” diode. Each vertical division represents 50 volts and that each horizontal division represents 5 milliseconds in time.

Note: Scope probes connected at machine output terminals.

SCOPE SETTINGS

Volts/Div	50V/Div.
Horizontal Sweep	5 ms/Div.
Coupling	DC
Trigger	Internal

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Return to Section TOC
Return to Master TOC

BRUSH REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

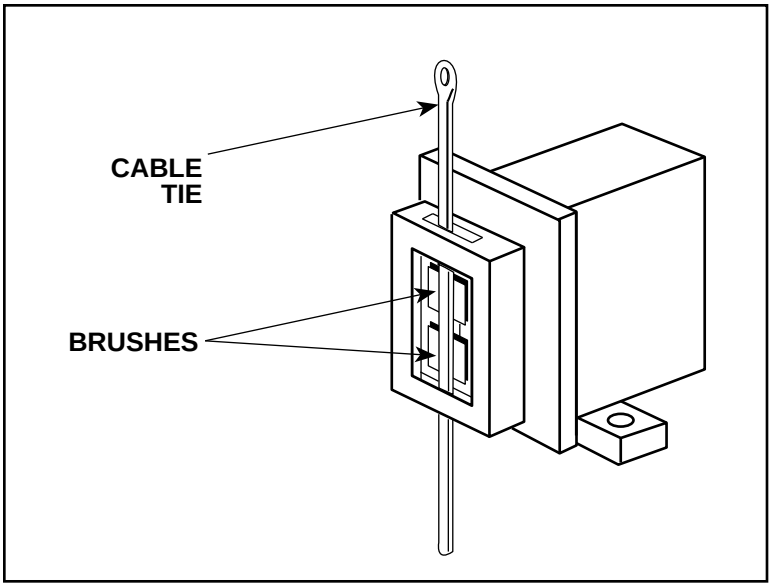
The following procedure will aid the technician in accessing the generator brushes for maintenance or replacement.

MATERIALS NEEDED

Small slot head screw driver
1/4” Nut driver
Needle nose pliers

BRUSH REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.14 - BRUSHES RETAINED WITH CABLE TIE



PROCEDURE

1. Remove the spark plug wire.
2. Open the brush holder assembly cover. Squeeze the 2 tabs and depress the cover at the top with a screw driver or your fingernail. The cover will drop open on its bottom hinge.
3. With the 1/4" nut driver, remove the 2 screws that hold the brush holder assembly in place.
4. With the needle nose pliers, gently remove the black and the red wires.

Note: The red wire is inboard. "RED" is marked on the brush holder beside the terminal for the red wire.

5. To change the brushes, use the slot head screw driver to pop off the plastic retainer on the back of the brush holder assembly.
6. Remove the old brush assemblies and insert the new ones. One corner of the terminal clip is beveled so that the brush can go in only one way.
7. Snap the plastic retainer back onto the brush holder. The brushes may need some repositioning; wiggle them slightly to help them seat properly on the slip rings.

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Return to Master TOC
Return to Section TOC
Return to Master TOC

PROCEDURE *(continued)*

8. To reinstall the brush holder assembly, depress the spring-loaded brushes into the holder and slip a suitable non-metallic, fairly stiff retainer through the slots at the top and bottom of the holder. A cable tie works well; see Figure F.14. This will hold the brushes up so that you can easily install the holder.
9. With the needle nose pliers, reinstall the red and the black wires to the appropriate terminals on the brushes. The red wire is inboard.
10. Slip the holder into position in the generator end bracket. Be careful not to loosen the 2 attached wires.
11. Reinstall and tighten the 2 screws with the 1/4” nut driver.
12. Slowly remove the non-metallic retainer from the brush holder and let the brushes snap back against the slip rings.
13. Check the wire connections or clearance and tightness.
14. Snap the brush holder cover back into position.

Return to Section TOC
Return to Master TOC

RHEOSTAT REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

The following procedure will aid the technician in accessing and removing the output control rheostat for maintenance or replacement.

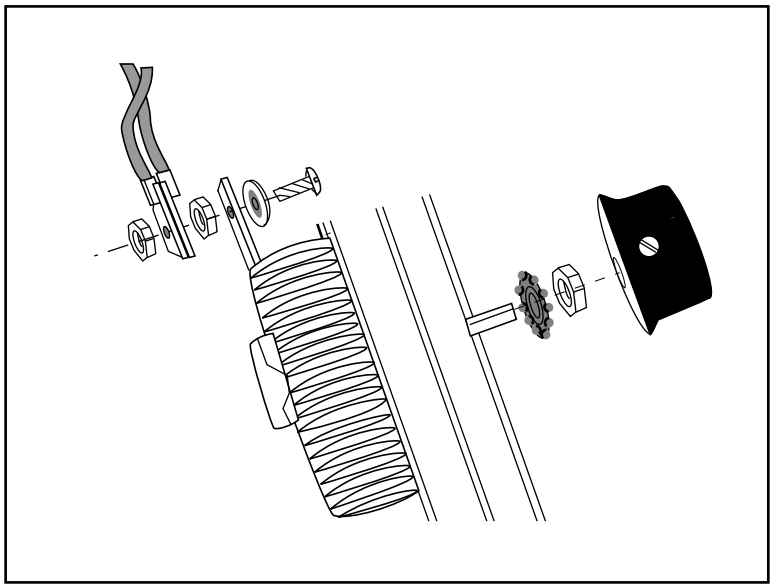
MATERIALS NEEDED

5/16” Nut driver
Small slot head screw driver
9/16” Open or box end wrench
5/16” Open or box end wrench
Needle nose pliers
Wiring Diagram

TROUBLESHOOTING & REPAIR

RHEOSTAT REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.15 - RHEOSTAT REMOVAL



See Figure F.15 for steps 3 - 9.

PROCEDURE

1. Remove the spark plug wire.
2. With the 5/16” nut driver, remove the 8 sheet metal screws that hold the top cover to the control box. Remove the top cover.
3. With the 5/16” nut driver and the 5/16” wrench, remove the 6 screws that hold the control panel in place. Move the panel aside as far as the leads will allow.
4. With the small slot head screw driver, loosen the screw that holds the knob to the rheostat shaft. The shaft has a flat for locating the knob at reassembly.
5. With a 9/16” open or box end wrench, remove the nut that holds the rheostat to the control panel. Support the rheostat with your hand as you turn the nut. There is a shake-proof washer under the nut.
6. Pull the rheostat back out of the control panel and lay it out on its wires to loosen the nuts that hold them.
7. With the 5/16” open or box end wrench, remove the brass nuts from the wire terminals. Support the terminals as you turn the wrench to avoid ripping the terminals from their foundations. Note the wire locations for reassembly.

Note: The brass screws are double-nutted with a shake-proof star washer under the screw head.

8. To reinstall the rheostat, replace each of the brass screws. Place a shake-proof star washer under the head, insert the screw into the rheostat and tighten down one nut. Replace the appropriate wires and tighten down the second nut. Again, support the terminals as you turn the wrench to avoid ripping the terminals from their foundations.
9. Reassemble the rheostat to the front of the control panel. Line up the locating tab on the rheostat with the slot on the control panel hole.
10. Reassemble the shake-proof star washer and nut and tighten securely with the 9/16” wrench.
11. Locate the flat spot on the shaft, line up the knob locking screw, push the knob onto the shaft and tighten the screw with the small slot head screw driver.
12. Check the rheostat knob for proper rotation, minimum to maximum.
13. Replace the control panel and tighten the 6 sheet metal screws with the 5/16” nut driver and 5/16” wrench.
14. Replace the top cover of the control box and tighten the 8 sheet metal screws with the 5/16” nut driver.

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FIELD CAPACITOR REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

The following procedure will aid the technician in accessing and removing the field capacitor for maintenance or replacement.

MATERIALS NEEDED

5/16” Nut driver
5/16” Wrench
Jumper wire with alligator clips on each end for discharging the field capacitor
Slot head screw driver
Needle nose pliers
Wiring Diagram

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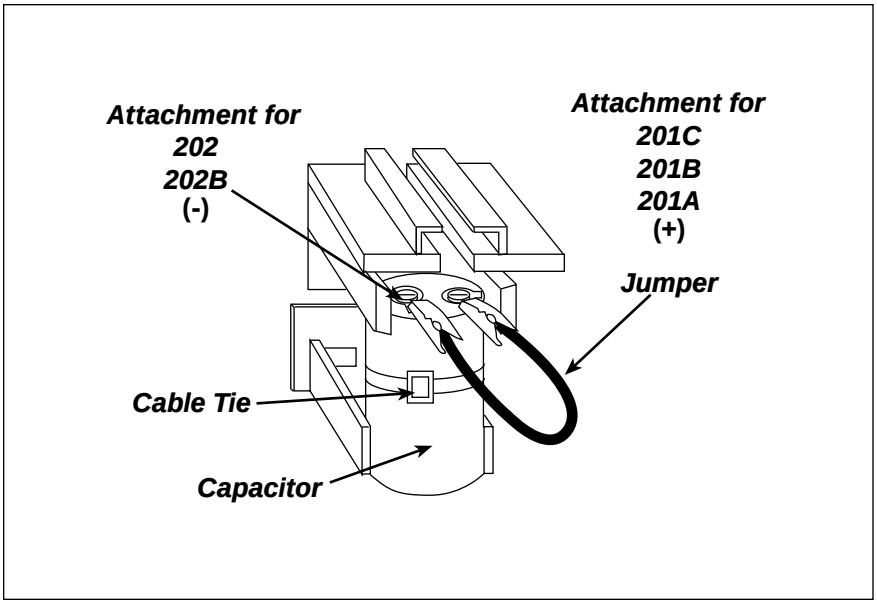
TROUBLESHOOTING & REPAIR

FIELD CAPACITOR REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.16 - DISCHARGING THE FIELD CAPACITOR



PROCEDURE

1. Remove the engine spark plug wire.
2. With the 5/16” nut driver, remove the 8 sheet metal screws that hold the top cover to the control box. Remove the top cover.
3. With the 5/16” nut driver and 5/16” wrench, remove the 6 screws that hold the control panel in place. Move the panel aside as far as the leads will allow.
4. Discharge the field capacitor by connecting the jumper wire clips on the black and the red wire terminals on the top of the capacitor. See Figure F.16. Leave the clips on for at least 5 seconds, then remove.
5. The capacitor is mounted in a molded plastic holder. To remove it, pull out on the top of the holder, then slide it upward.
6. Cut the tie wrap and snap the capacitor out of the assembly.
7. Loosen the two screws on the top of the capacitor. Leads #202B and #202 (Red) attach to the positive (+) terminal. Leads #201C, 201B and 201A (Black) attach to the negaive (-) terminal.
8. To replace the capacitor, reattach the leads to their respective terminals [202 and 202B Red to positive (+); 201C, 201B and 201A Black to negative (-)] and tighten the screws securely. Snap the capacitor back into the molded plastic holder and slide the holder back into position in the panel. Replace the tie wrap.
9. Replace the control panel and tighten the 6 sheet metal screws with the 5/16” nut driver and 5/16” wrench. Replace the top cover of the control box and tighten the 8 sheet metal screws with the 5/16” nut driver.

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FIELD DIODE BRIDGE REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

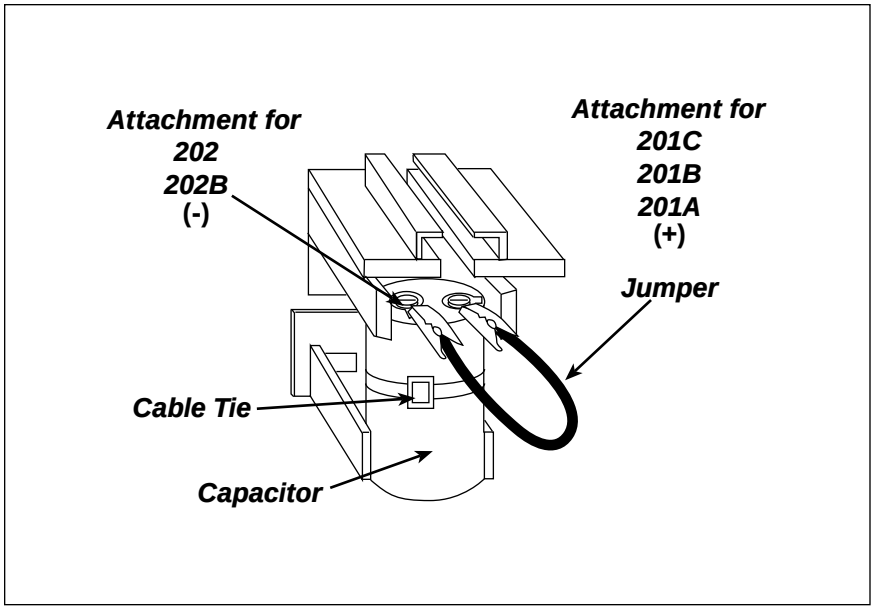
The following procedure will aid the technician in accessing and removing the field diode bridge for maintenance or replacement.

MATERIALS NEEDED

5/16” Nut driver
11/32” Wrench
5/16” Wrench
Jumper wire with alligator clips on each end for discharging the field capacitor
Slot head screw driver
Needle nose pliers
Wiring Diagram

FIELD DIODE BRIDGE REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.17 - DISCHARGING THE FIELD CAPACITOR



PROCEDURE

1. Remove the engine spark plug wire.
2. With the 5/16” nut driver, remove the 8 sheet metal screws that hold the top cover to the control box. Remove the top cover.
3. With the 5/16” nut driver and the 5/16” wrench, remove the 6 screws that hold the control panel in place. Move the panel aside as far as the leads will allow.
4. Discharge the field capacitor by connecting the jumper wire clips on the black and the red wire terminals on the top of the capacitor. See Figure F.17 for location. Leave the clips on for at least 5 seconds, then remove.

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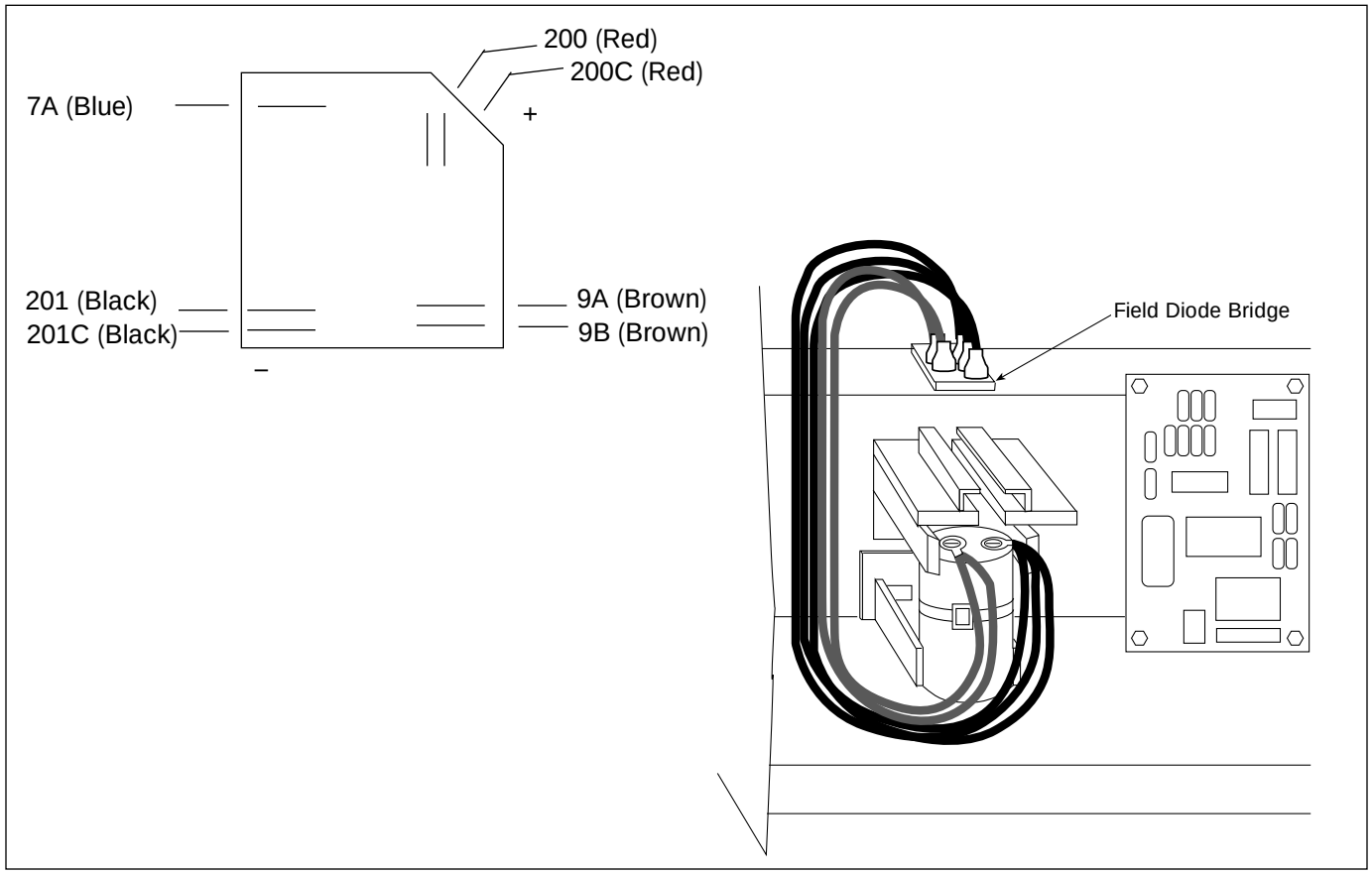
TROUBLESHOOTING & REPAIR

FIELD DIODE BRIDGE REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.18 - FIELD DIODE BRIDGE LOCATION



5. The field diode bridge is mounted to the sheet metal just above the capacitor. See Figure F.18. Remove it using the slot head screw driver and the 11/32” wrench.
6. With the needle nose pliers, gently remove the 7 wires from the diode bridge.
7. Replace the wires to their appropriate locations on the new diode bridge:

Lead 200 and 200C are piggy-backed to the positive (+) terminal. Depending on the bridge used, this corner may be beveled and/or marked with a + sign.

Lead 201 (Black) and 201B (Black) are piggy-backed on the negative (–) terminal, which will always be located diagonally across from the positive (+) terminal.

The Blue lead (7A) is attached to one AC terminal. Leads 9A and 9B are piggy-backed to the other AC terminal.

8. Mount the field diode bridge using the screw, washers and nut. Use the slot head screwdriver and 11/32” wrench.
9. Check that the leads are not grounded and for clearance and tightness.
10. Replace the control panel and tighten the 6 sheet metal screws with the 5/16” nut driver and 5/16” wrench.
11. Replace the top cover of the control box and tighten the 8 sheet metal screws with the 5/16” nut driver.

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IDLER PRINTED CIRCUIT BOARD REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

The following procedure will aid the technician in accessing and removing the idler printed circuit board for maintenance or replacement.

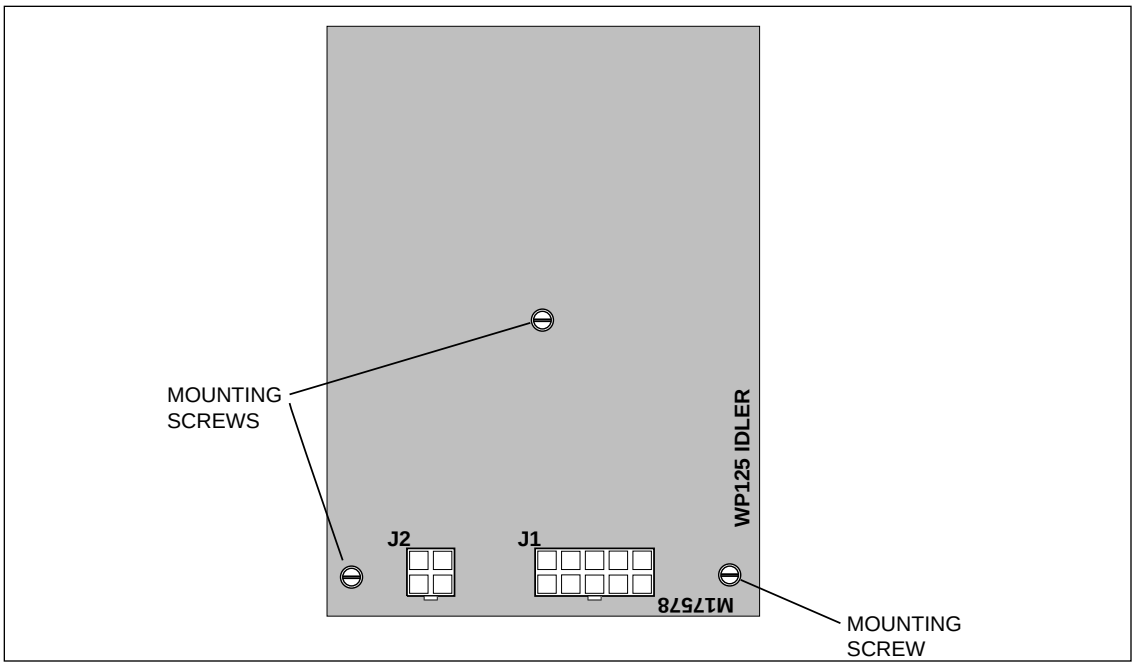
MATERIALS NEEDED

5/16" Nut driver
5/16" Wrench
1/4" Nut driver
Static grounding wrist strap

TROUBLESHOOTING & REPAIR

IDLER PRINTED CIRCUIT BOARD REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.19 - IDLER P.C. CIRCUIT BOARD



PROCEDURE

Before starting the following procedure, refer to the topic "PC Board Troubleshooting Procedures" at the beginning of this section.

1. Remove the engine spark plug wire to prevent accidental kickback or starting.
2. With the 5/16" nut driver, remove the 8 sheet metal screws that hold the top cover in place. Remove the cover.
3. With the 5/16" nut driver and 5/16" wrench, remove the 6 sheet metal screws that hold the control panel in place. Carefully move the control panel aside as far as the leads will allow.
4. Locate and remove the two molex plugs connected to the idler P.C. board. See Figure F.19.
5. With the 1/4" nut driver, remove the 3 P.C. board mounting screws.
6. Carefully remove the board.

⚠ CAUTION

Be sure to follow the recommended static-free methods for handling printed circuit boards. Failure to do so can result in permanent damage to the equipment.

6. Replace the old idler P.C. board. Mount the new board with the 3 mounting screws and 1/4" nut driver.
7. Replace the control panel and tighten the 6 sheet metal screws with the 5/16" nut driver and 5/16" wrench.
8. Replace the top cover of the control box and tighten the 8 sheet metal screws with the 5/16" nut driver.

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OUTPUT RECTIFIER BRIDGE REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

The following procedure will aid the technician in removing the output rectifier bridge for maintenance or replacement.

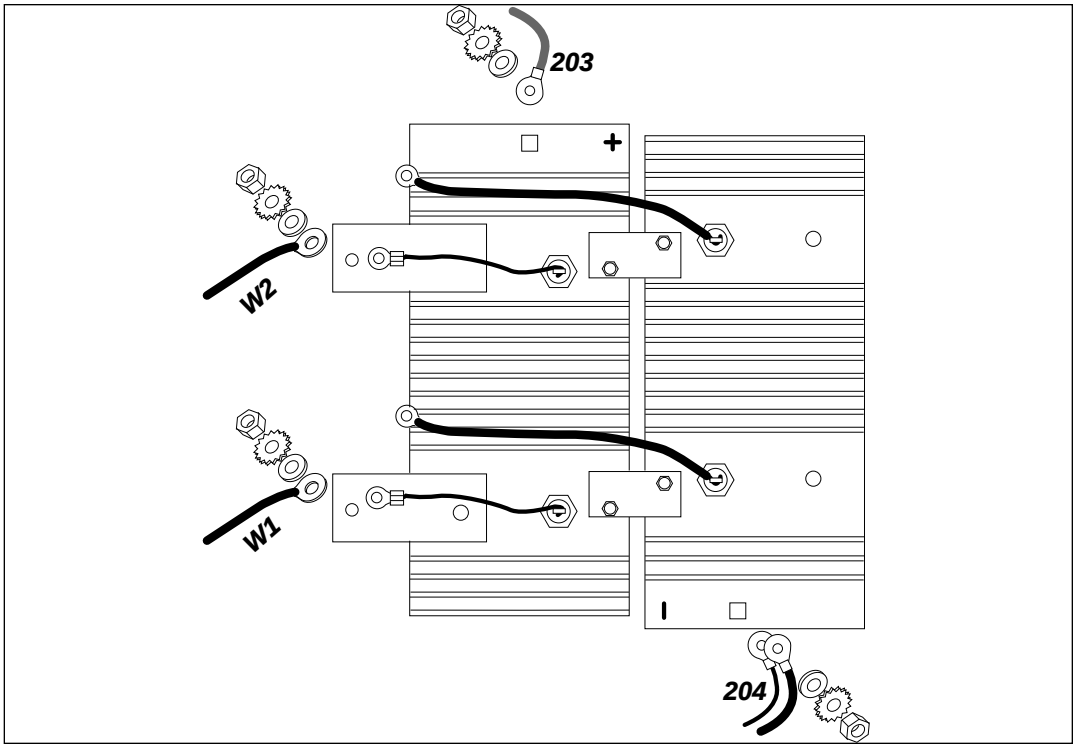
MATERIALS NEEDED

5/16" Nut driver
7/16" Wrench
3/8" Wrench
Dow Corning 340

TROUBLESHOOTING & REPAIR

OUTPUT RECTIFIER BRIDGE REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.20 - OUTPUT RECTIFIER CONNECTIONS



PROCEDURE

1. Remove the engine spark plug wire to prevent accidental kickback or starting.
2. With the 5/16" nut driver, remove the 8 sheet metal screws from the case top.
3. With the 7/16" wrench, remove the heavy leads W1 and W2 from the stud terminals. You do not have to remove the diode pigtails from the terminals. See Figure F.20.
4. With the 7/16" wrench, remove the "N" negative lead and the #204 lead from the negative heat sink. Note placement of the leads for reassembly.
5. With the 7/16" wrench, remove the choke lead and the #203 lead from the positive heat sink. Note placement of the leads for reassembly.
6. With the 3/8" wrench, remove the four mounting screws holding the output rectifier bridge assembly to the choke. Note the placement of the insulators. When you reassemble the output rectifier bridge, the heat sink assembly MUST be electrically isolated from case ground.
7. Carefully lift up and remove the output rectifier bridge assembly.
8. Reassembly: Refer to the Wiring Diagram for proper connections to the positive and negative sides of the rectifier assembly. The two sides of the bridge are marked + and –, respectively.

NOTE: Use Dow Corning 340 on all aluminum electrical connection surfaces. If you replace individual diodes, use Dow Corning 340 on all mating surfaces between the diodes and the heatsink.

9. Install the rectifier bridge assembly by tilting it down into its position above the choke assembly. Be sure that the positive (+) side of the bridge, as marked, is on the right side of the machine, looking from the case front.
10. With the 3/8" wrench and slot head screw driver, install the four mounting screws (two on each side). Note the placement of the nylon insulators. **These must be in place when you install the rectifier bridge assembly in order to electrically insulate the bridge from the choke lamination assembly.**

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11. With the 7/16" wrench, install the choke lead and the #203 lead to the positive heat sink.
12. With the 7/16" wrench, install the "N" negative lead and the #204 lead to the negative heat sink.
13. With the 7/16" wrench, install the heavy leads W1 and W2 to the stud terminals.
14. Replace the top cover of the control box and tighten the 8 sheet metal screws with the 5/16" nut driver.

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OUTPUT CHOKE REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

The following procedure will aid the technician in accessing and removing the output choke assembly for maintenance or replacement.

MATERIALS NEEDED

5/16" Nut driver
5/16" Wrench
9/16" Wrench
1/2" Wrench
Diagonal cutters
Dow Corning 340

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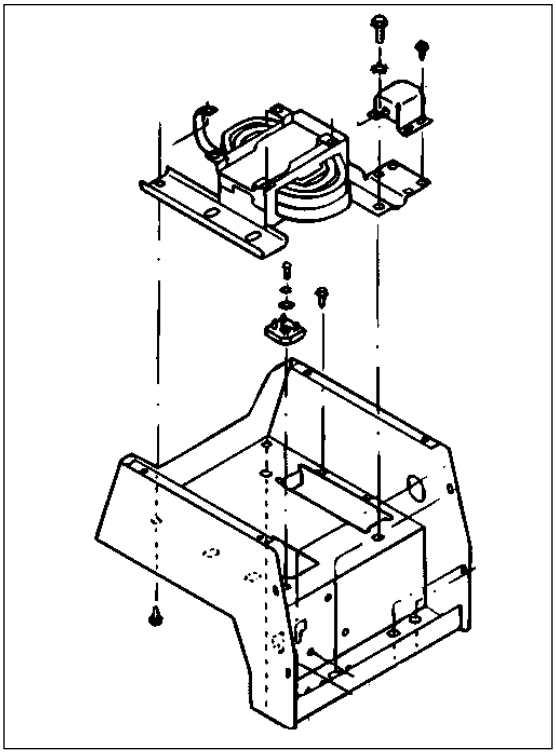
TROUBLESHOOTING & REPAIR

OUTPUT CHOKE REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.21 - OUTPUT CHOKE MOUNTING DETAILS



PROCEDURE

1. Remove the engine spark plug wire to prevent accidental kickback or starting.
2. With the 5/16" nut driver, remove the 8 sheet metal screws from the case top.
3. With the 5/16" nut driver and 5/16" wrench, remove the 6 sheet metal screws that hold the control panel in place. Carefully move the control panel aside as far as the leads will allow.
4. Remove the output rectifier bridge. Refer to "THE OUTPUT RECTIFIER BRIDGE REMOVAL AND REPLACEMENT" procedure in this section of the manual.
5. With the 9/16" wrench, remove the heavy choke lead from the positive output terminal.
6. With the 1/2" wrench, remove the four mounting screws that hold the output choke in place.

NOTE: The two thread forming screws (with shake-proof lock washers) are used in the two holes nearest the engine.

7. With the 5/16" nut driver, remove the one sheet metal screw that holds the choke assembly to the sheet metal.
8. Cut any necessary cable ties with the diagonal cutters.
9. Unfasten any necessary cable restraints.
10. With the 5/16" nut driver, remove the sheet metal grounding screw and the two green ground wires.
11. Remove the two leads #208 and #209 from the idler solenoid.
12. Remove lead #14 from lead #14A by pulling apart the quick connect splice.
13. Carefully remove the choke assembly by lifting up and out.

NOTE: The idler solenoid will be removed with the choke assembly. Take care to slide the plunger out from the solenoid housing.

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14. Reassembly: Install the output choke assembly by setting it down into position. Fit the idler solenoid plunger into the solenoid housing.
15. Assemble the quick connect splice that connects lead #14 to lead #14A.
16. Connect the two leads #208 and #209 to the idler solenoid.
17. With the 5/16" nut driver, install the sheet metal grounding screw and the two green ground wires.
18. With the 5/16" nut driver, install the one sheet metal screw that holds the choke assembly to the sheet metal.
19. With the 1/2" wrench, install the four mounting screws that hold the output choke in place.

NOTE: The two thread forming screws (with shake-proof lock washers) are used in the two holes nearest the engine.

20. With the 9/16" wrench, install the heavy choke lead from the positive output terminal.
21. Replace the output rectifier bridge. Refer to "THE OUTPUT RECTIFIER BRIDGE REMOVAL AND REPLACEMENT" procedure in this section of the manual.
22. Replace any cable ties you cut for removal. Fasten any cable restraints.
23. Replace the control panel and tighten the 6 sheet metal screws with the 5/16" nut driver and 5/16" wrench.
24. Replace the top cover of the control box and tighten the 8 sheet metal screws with the 5/16" nut driver.
25. Start the gasoline engine and check the low idle RPM. Low idle RPM should be between 2250 - 2500 RPM. If adjustment is necessary, refer to the topic "ENGINE THROTTLE ADJUSTMENT TEST" in this section of the manual.

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STATOR/ROTOR REMOVAL AND REPLACEMENT

⚠ WARNING

Service and repair should be performed by only Lincoln Electric factory trained personnel. Unauthorized repairs performed on this equipment may result in danger to the technician or machine operator and will invalidate your factory warranty. For your safety and to avoid electrical shock, please observe all safety notes and precautions detailed throughout this manual.

If for any reason you do not understand the test procedures or are unable to perform the test/repairs safely, contact the Lincoln Electric Service Department for electrical troubleshooting assistance before you proceed. Call 216-383-2531 or 1-800-833-9353 (WELD).

DESCRIPTION

The following procedure will aid the technician in removing the stator and/or rotor for maintenance or replacement of either component.

MATERIALS NEEDED

Lincoln Electric Rotor Removal Kit (S20925) - **FOR ROTOR REMOVAL ONLY**

5/16" nut driver
1/2" socket wrench
6" socket extension
Slot head screw driver
5/8" socket wrench
7/16" socket wrench
7/16" open or box end wrench
9/16" open or box end wrench
3/4" socket or box end wrench
1/2" socket or box end wrench
Needle nose pliers
Diagonal cutters
Torque wrench (ft lbs)
Babbitt, leather, or wooden mallet
Volt/ohmmeter
12" (long) feeler gauge (.010)

INSTRUCTIONS

For stator removal only, follow steps 1 -18 under STATOR REMOVAL PROCEDURE. For reassembly of stator, go to REASSEMBLY PROCEDURE steps 3 - 23.

For rotor removal, follow the STATOR REMOVAL PROCEDURE, ROTOR REMOVAL PROCEDURE, and REASSEMBLY PROCEDURE.

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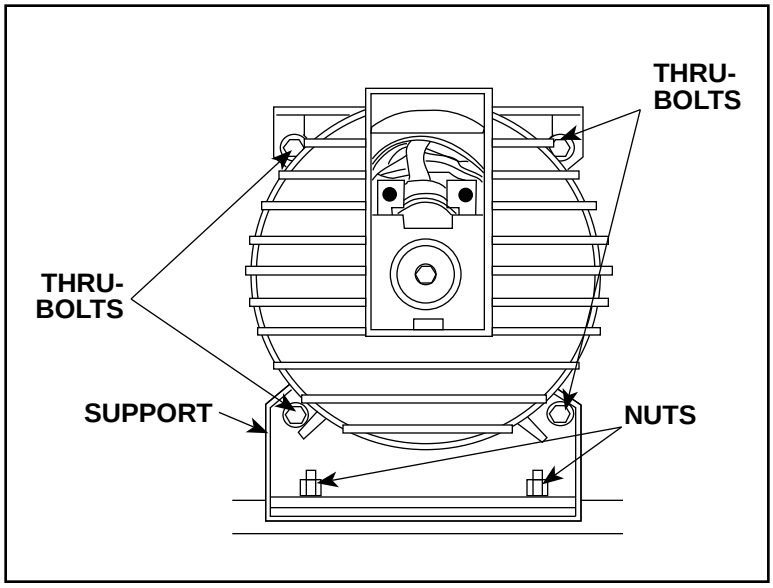
STATOR REMOVAL PROCEDURE

1. Remove the engine spark plug wire to prevent accidental kickback or starting.
2. Perform the Output Rectifier Bridge Removal procedure.
3. Perform the Output Choke Removal procedure.
4. Remove lead #14A from the control box assembly.
5. With the 5/16" nut driver, remove the 4 sheet metal screws that mount the control box assembly to the stator frame.
6. Unplug the large 6 pin molex plug (quick connect).
7. Cut any necessary cable ties.
8. Remove the W1 lead from the current transformer.
9. Remove the green ground lead (GND-C) from the wiring harness loom.
10. With the slot head screw driver, remove leads #201A and 202B from the field capacitor. It may be necessary to cut the cable tie that holds the capacitor into its mounting bracket.
11. Carefully slide out the control box assembly (with the control panel). Be careful to clear the leads and the solenoid plunger and throttle linkage.
12. Remove the brush holder assembly. Open the brush holder assembly cover. Squeeze the 2 tabs and depress the cover at the top with a screw driver or your fingernail. The cover will drop open on its bottom hinge. With the 1/4" nut driver, remove the 2 screws that hold the brush holder assembly in place. With the needle nose pliers, gently remove the black and the red wires. Set the brush holder aside. Pull the wires up into the control box.

TROUBLESHOOTING & REPAIR

STATOR/ROTOR REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.22 - STATOR END BRACKET SUPPORT AND THRU-BOLTS



13. Slide a short length of 2 X 4 under the engine to support it when the stator is removed.
14. With the 1/2" socket wrench, remove the 2 nuts that hold the stator end bracket support. See Figure F.22 for location. There are 2 split-ring lock washers and 2 flat washers along with the nuts.
15. With the 7/16" socket and 7/16" end wrench, remove the 4 thru-bolts for the generator assembly. See Figure F.22. All 4 bolts have a split-ring lock washer under the head and a shake-proof star washer on the nut side. The bolts must point toward the engine for reassembly.
16. Lift up the stator and slide out the support bracket. The engine will now rest on the 2 X 4.
17. With the babbitt/leather/wooden mallet, tap off the end bracket. Alternate sides as you tap; watch the bearing to judge the amount of movement you're getting.
18. Once the end bracket is off, carefully pull off the stator. IMPROPER HANDLING OF THE STATOR CAN RESULT IN SHORTED WINDINGS AND/OR LOST OUTPUT.

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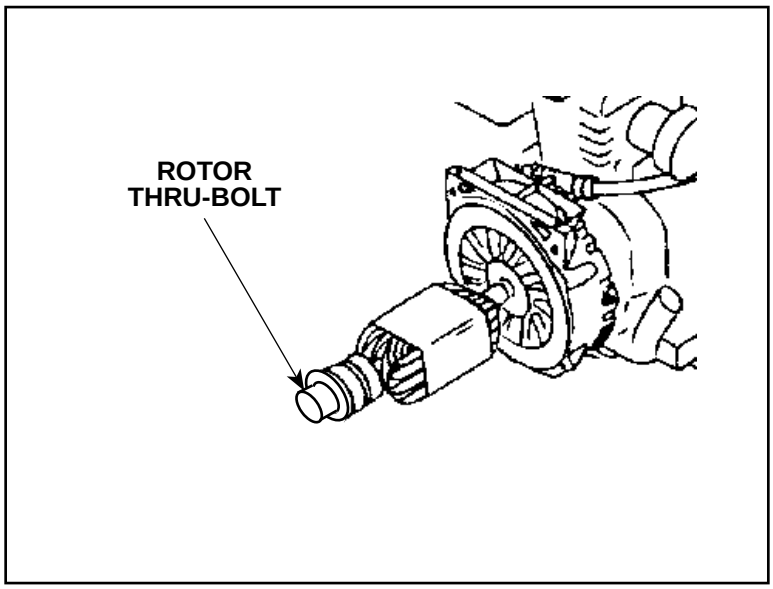
STATOR/ROTOR REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.23 - ROTOR WITH STATOR REMOVED



ROTOR REMOVAL PROCEDURE

1. To remove the rotor, double check that the spark plug wire is disconnected. You will be turning the rotor during this procedure, and this could accidentally cause engine kickback.
2. With an impact wrench, remove the rotor thru-bolt. See Figure F.23. If an impact wrench is not available, use the 1/2" box wrench. Hold the rotor with one hand and shock the wrench with the mallet to loosen the thru-bolt. The thru-bolt has a star washer and lock washer, beveled to conform to the rotor shaft. Pull out the thru-bolt.
3. Install the long thru-bolt supplied with Lincoln Electric Rotor Removal Kit S20925. The slot head must face out. Screw in the bolt with the slot head screw driver until the bolt bottoms out on the engine crankshaft, about 3/4".
4. Turning it counterclockwise, screw in the reverse thread bolt from the kit into the rotor shaft until it bottoms out on the thru-bolt.
5. With an impact wrench, tighten the reverse thread bolt until the rotor pops off the engine crankshaft. If an impact wrench is not available, use the 1/2" box wrench. Hold the rotor with one hand and shock the wrench with the mallet until the rotor pops off the engine crankshaft.
6. Slide the rotor and blower (press-fitted to the rotor) the rest of the way off the crankshaft.

REASSEMBLY PROCEDURE

1. Lubricate the tapered engine crankshaft. Slide the rotor onto the shaft.
2. Coat the rotor thru-bolt threads with Lincoln E177-R retaining compound (Locktite® 277). Place the beveled lock washers onto the thru-bolt and insert it into the rotor shaft. Hold the rotor and tighten the thru-bolt to 22 - 25 ft lbs.
3. Carefully install the stator, with the leads at the 1 o' clock position. IMPROPER HANDLING OF THE STATOR CAN RESULT IN SHORTED WINDINGS AND/OR LOST OUTPUT.

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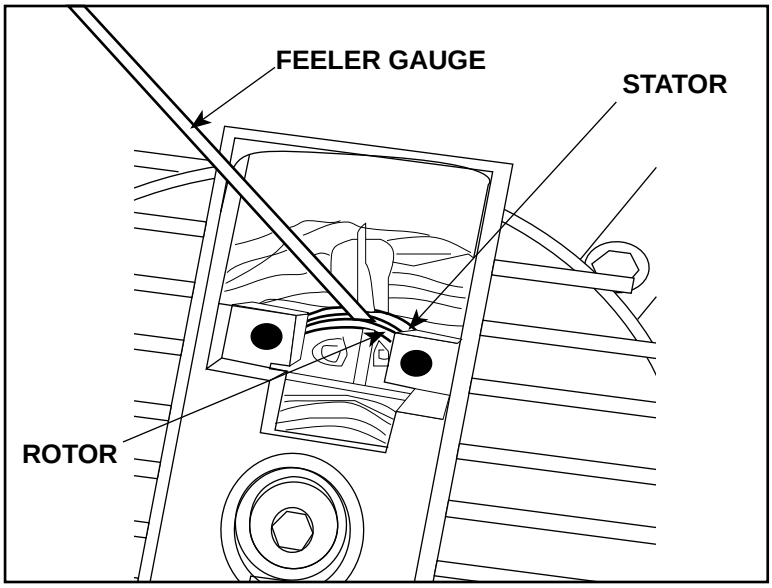
STATOR/ROTOR REMOVAL AND REPLACEMENT *(continued)*

FIGURE F.24 - CHECKING ROTOR-STATOR AIR GAP



4. Install the end bracket. Slide it on and install the two top thru-bolts loosely to hold the end bracket for the next step.
5. Install the end bracket support.
6. Install the bottom two end bracket thru-bolts.
7. Tap the end bracket with the mallet as necessary to position it. Tighten the bolts to 22 - 25 ft lbs. Alternate tightening in order to pull the assembly together evenly. As you tighten, look through the brush housing access door and watch the bearing to judge end bracket movement and alignment.
8. Check the rotor-stator air gap with the long .010 feeler gauge. The measurement is taken through the brush holder access door; see Figure F.24. Turn the engine with the recoil starter rope slightly so that the rotor "iron" is up to take the measurement. (The rotor has two flat sides, which are not measured for air gap.) Slide in the gauge. Then rotate the shaft 180 degrees and measure again. If the gauge does not clear, loosen the four end bracket thru-bolts, reposition the end bracket, retighten the bolts, and recheck the air gap. Repeat until the proper .010 minimum air gap is achieved (.030 maximum).
9. Tighten the end bracket support nuts and lock washers. Remove the 2 X 4 engine support.
10. Reinstall the brush holder assembly. Refer to the topic "BRUSH REMOVAL AND REPLACEMENT" in this section of the manual.
11. Slide the control box back into place.
12. Connect leads #201A and #202B to the field capacitor. Replace the cable tie if it was cut earlier.
13. Connect the green ground lead (GND-C) to the wiring harness loom.
14. Connect the W1 lead to the current transformer.
15. Connect the 6 pin molex plug.
16. With the 5/16" nut driver, install the control box assembly to the stator frame with 4 sheet metal screws.
17. Connect lead #14A to its location inside the control box assembly.

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18. Install the output choke. Refer to the topic "OUTPUT CHOKE REMOVAL AND REPLACEMENT" in this section of the manual.
19. Install the output rectifier bridge. Refer to the topic "OUTPUT RECTIFIER BRIDGE REMOVAL AND REPLACEMENT" in this section of the manual.
20. Replace the control panel and tighten the 6 sheet metal screws.
22. Replace the top cover to the control box and tighten the 8 sheet metal screws.
23. Conduct the "RETEST AFTER REPAIR" procedure, the following topic in this section of the manual.

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RETEST AFTER REPAIR

Retest a machine:

- If it is rejected under test for any reason that requires you to remove any mechanical part which could affect the machine's electrical characteristics.

  OR

- If you repair or replace any electrical components.

ENGINE OUTPUT

	No Load RPM	Load RPM
Maximum Speed	3800	3500
Minimum Speed	3700	3300

WELDER/GENERATOR OUTPUT[1]

Output Control	Field Volts	Field Amps	Open Circuit Volts	Load Volts RMS	Load Amps
Maximum	40 - 47	4.0 - 6.4	75 - 82	22 - 28	125 - 135
Minimum	–	–	70 - 78	23 - 27	40 - 55

AUXILIARY POWER RECEPTACLE OUTPUT[1]

230 Volt Receptacle				115 Volt Receptacle[2]		
Output Control	Open Circuit Volts	Load Volts	Load Amps	Open Circuit Volts	Load Volts	Load Amps
Maximum	240 - 260	208 - 234	20.2 - 22.0	120 - 130	104 - 117	20.2 - 22.0

[1] Current Control Dial set at MAXIMUM.

[2] Output values of each receptacle can vary within the range shown but must be within 2 volts of each other.

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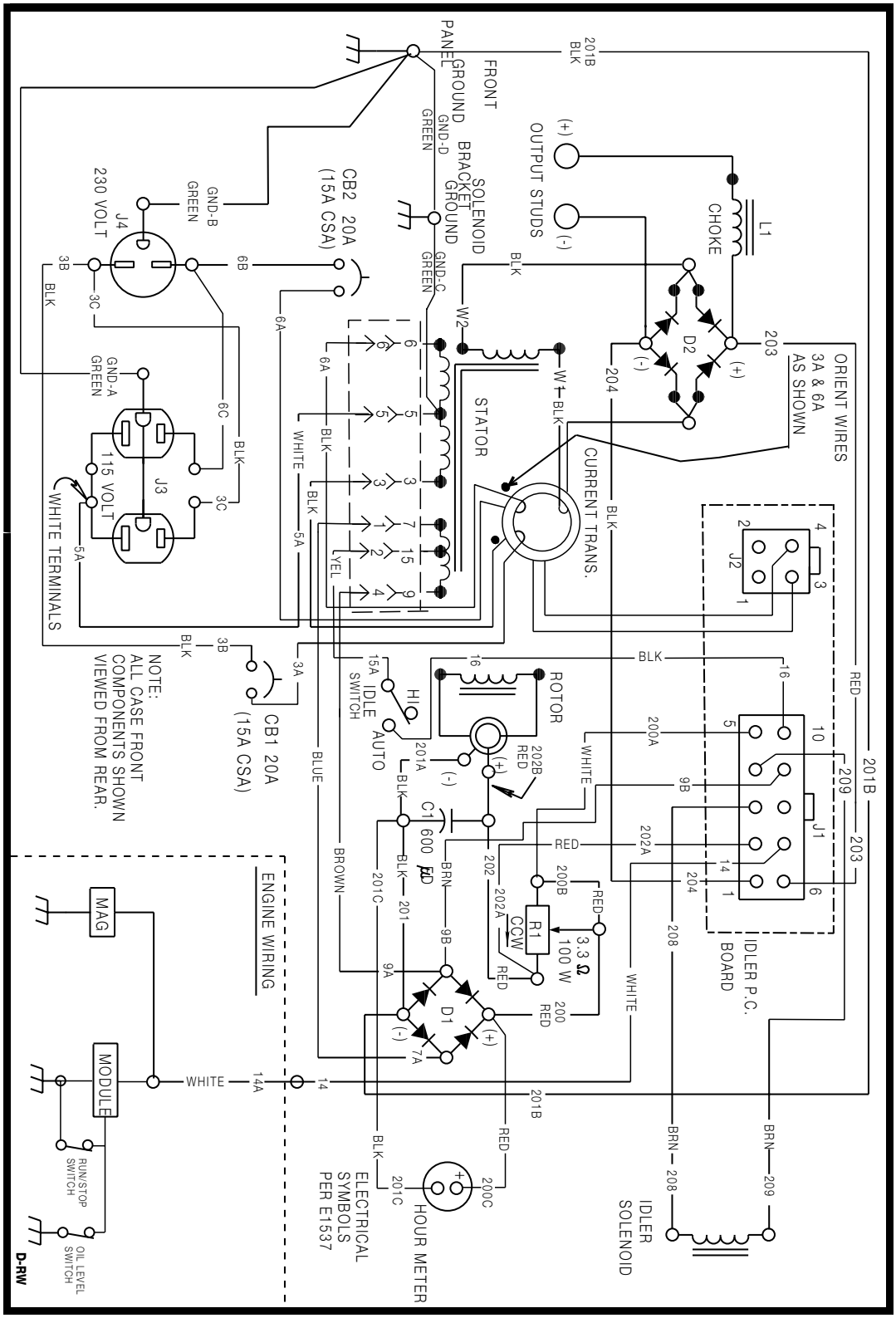
DIAGRAMS

WIRING DIAGRAM — (CODE 10158 & 10160)



NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels.

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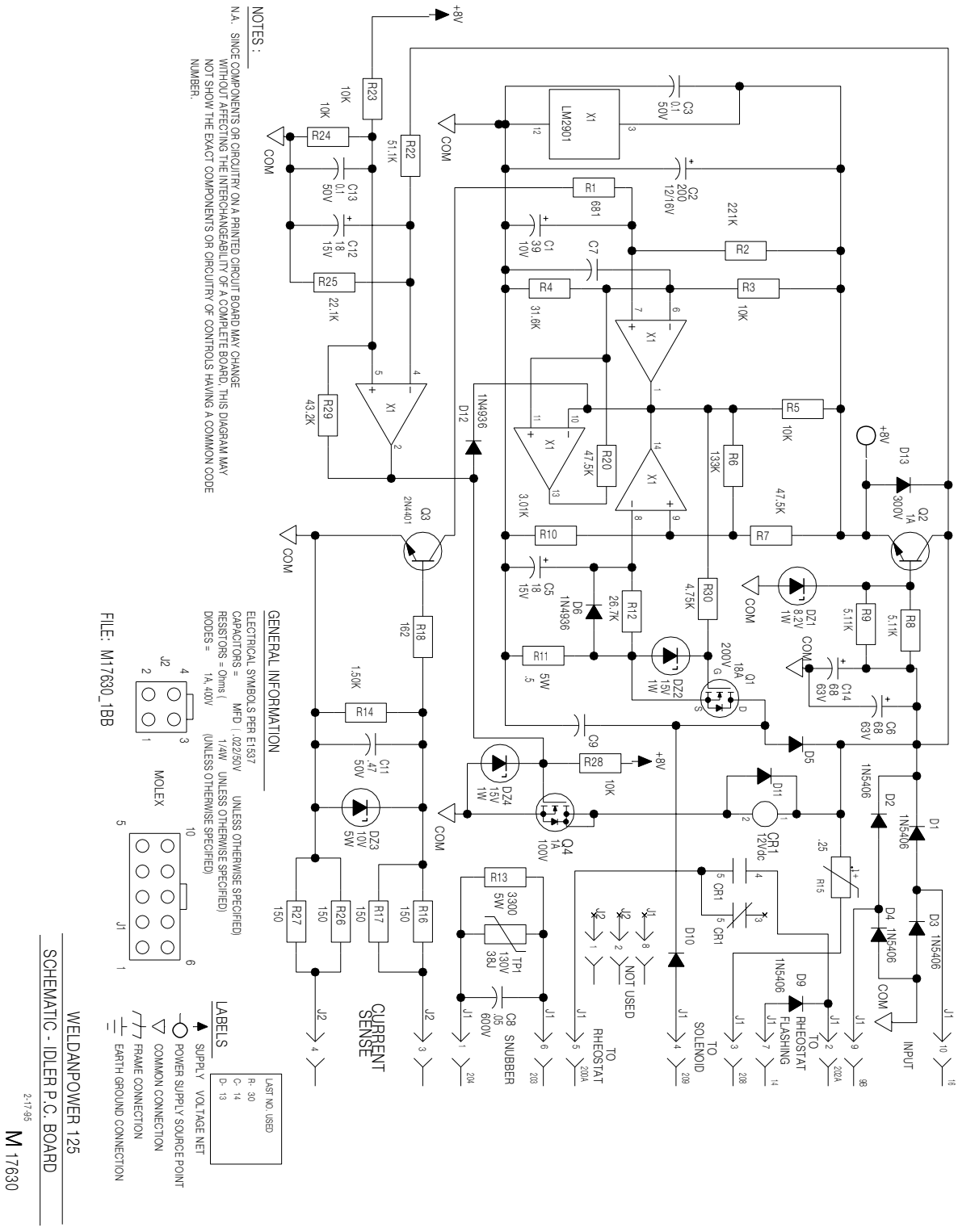
IDLER PC BOARD (M17578) SCHEMATIC



NOTE: Lincoln Electric assumes no responsibility for liabilities resulting from board level troubleshooting. PC Board repairs will invalidate your factory warranty. This Printed Circuit Board Schematic is provided for reference only. It may not be totally applicable to your machine's specific PC board version. This diagram is intended to provide general information regarding PC board function.

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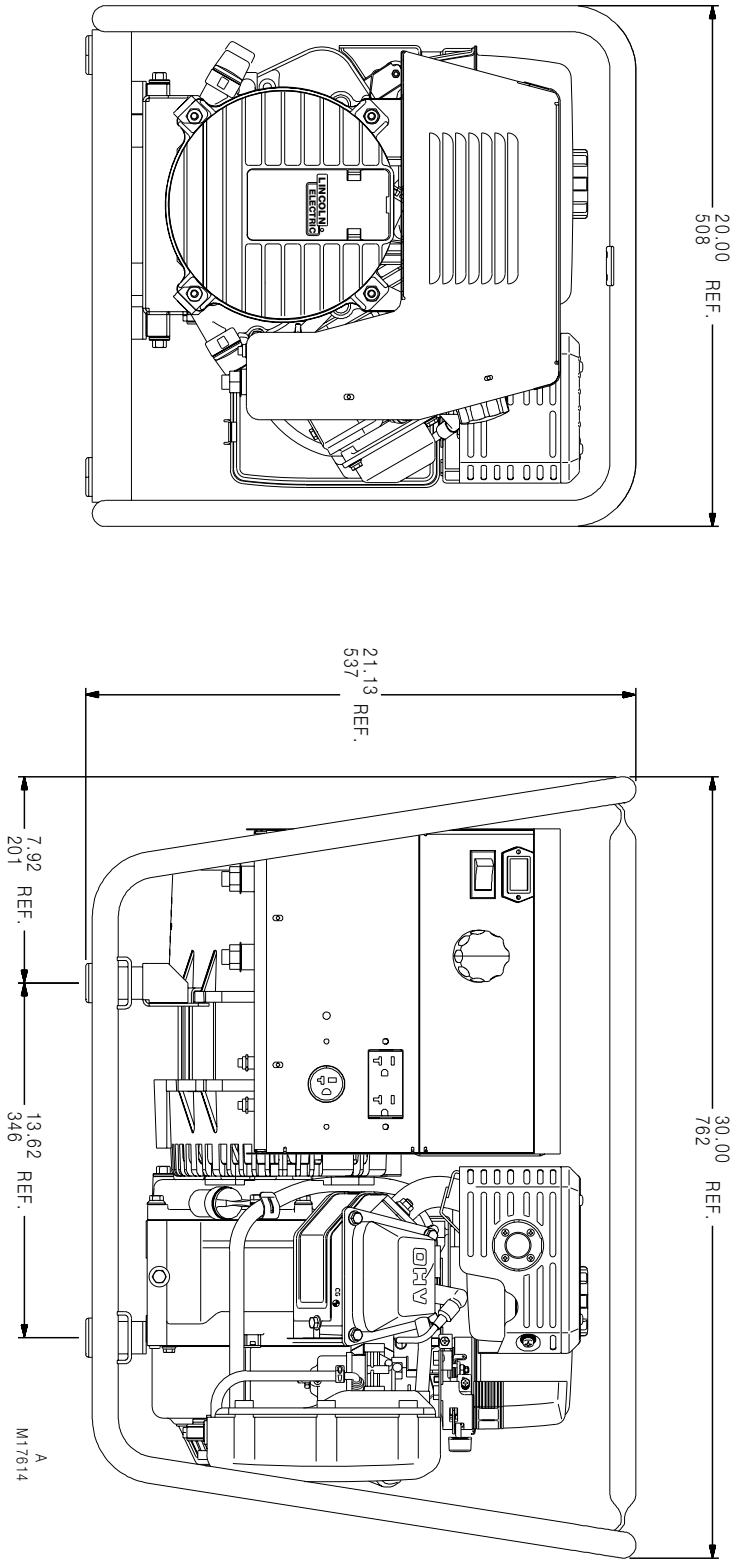
DIAGRAMS

DIMENSION PRINT — WELDANPOWER 125



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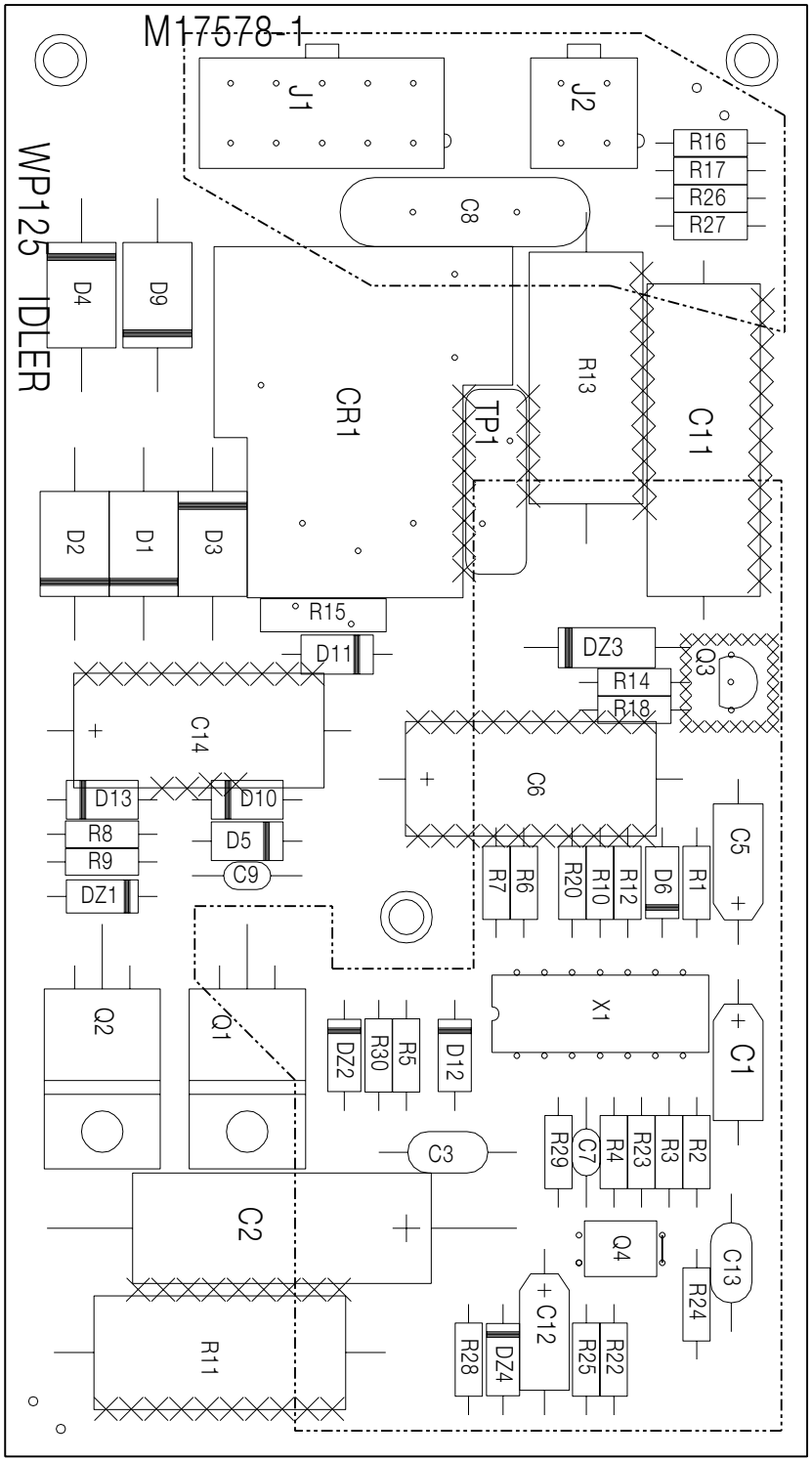
DIAGRAMS

M17578 IDLER PC BOARD



NOTE: Lincoln Electric assumes no responsibility for liabilities resulting from board level troubleshooting. PC Board repairs will invalidate your factory warranty. Individual Printed Circuit Board Components are not available from Lincoln Electric. This information is provided for reference only. Lincoln Electric discourages board level troubleshooting and repair since it may compromise the quality of the design and may result in danger to the Machine Operator or Technician. Improper PC board repairs could result in damage to the machine.

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DIAGRAMS

M17578 IDLER PC BOARD BILL OF MATERIALS

Item	Description
C1	CAPACITOR-TAEL,39,10V,10%
C2	CAPACITOR-ALEL,200,12/16V/+75/-10%
C3,C13	CAPACITOR-CEMO,0.1,50V,10%
C5,C12	CAPACITOR-TAEL,18,15V,10%
C6,C14	CAPACITOR-ALEL,68,63V,+50/-20%
C7,C9	CAPACITOR-CEMO,.022,50V,20%
C8	CAPACITOR-CD,.05,600V,+80/-20%
C11	CAPACITOR-PEF,0.47,50V,10%
CR1	RELAY-SPDT,12VDC,155OHMS,AG-CDO
D1,D2,D3,D4,D9	DIODE-AXLDS,3A,600V,1N5406
D5,D10,D11,D13	DIODE-AXLDS,1A,400V
D6,D12	DIODE-AXLDS,1A,400V,FR,1N4936
DZ1	ZENER DIODE-1W,8.2V,5%,1N4738A
DZ2,DZ4	ZENER DIODE-1W,15V,5%,1N4744A
DZ3	ZENER DIODE-5W,10V,5%,1N5347B
J1	CONNECTOR,MOLEX,MINI,PCB,10-PIN
J2	CONNECTOR,MOLEX,MINI,PCB,4-PIN
Q1	TRANSISTOR-NMF,T220,18A,200V,IRF640
Q2	TRANSISTOR-N,T220,1A,300V,TIP48
Q3	TRANSISTOR-N,T226,0.5A,40V,2N4401
Q4	TRANSISTOR-NMF,4PDIP,1A,100V,RFD110
R1	RESISTOR-MF,1/4W,681,1%
R2	RESISTOR-MF,1/4W,221K,1%
R3,R5,R23, R24,R28	RESISTOR-MF,1/4W,10.0K,1%
R4	RESISTOR-MF,1/4W,31.6K,1%
R6	RESISTOR-MF,1/4W,133K,1%
R7,R20	RESISTOR-MF,1/4W,47.5K,1%
R8,R9	RESISTOR-MF,1/4W,5.11K,1%
R10	RESISTOR-MF,1/4W,3.01K,1%
R11	RESISTOR-WW,5W,0.5,5%,SQ
R12	RESISTOR-MF,1/4W,26.7K,1%
R13	RESISTOR-WW,5W,3.3K,5%,SQ
R14	RESISTOR-MF,1/4W,1.50K,1%
R15	THERMISTOR-PTC,.02-0.47 OHMS,0.90A
R16,R17,R26,R27	RESISTOR-MF,1/4W,150,1%
R18	RESISTOR-MF,1/4W,162,1%
R22	RESISTOR-MF,1/4W,51.1K,1%
R25	RESISTOR-MF,1/4W,22.1K,1%
R29	RESISTOR-MF,1/4W,43.2K,1%
R30	RESISTOR-MF,1/4W,4.75K,1%
TP1	MOV-130VRMS,38J,14MM
X1	IC-COMPARATOR,QUAD,2901N

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